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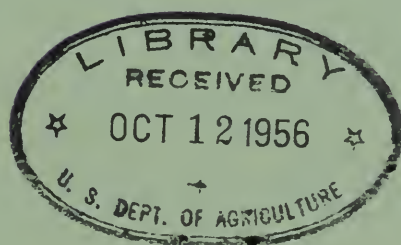
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STATION'S QUARTERLY REPORT

2nd Quarter

Calendar Year 1949



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Northeastern
Forest Experiment Station
5a Upper Darby, Pa.
VL Harper, Director



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STATION'S QUARTERLY REPORT

2nd Quarter
Calendar Year 1949

GENERAL

By I. H. Sims

The Director was busy, as usual, in both field and office during the quarter. General program planning and development for the Station as a whole, the usual grist of working plans and manuscripts to be reviewed, and appropriation and legislative matters demanded attention. One of the highlights of the quarter was the passage of a bill increasing the authorization for Forest Survey; the new authorization is considered adequate for doing the Forest Survey job, both initial inventory and reanalysis.

Dr. Harper also made several addresses; before the West Virginia Forest Council at Elkins and on the Fernow Experimental Forest; before the Technical Association of the Pulp and Paper Industry at Lake George, N. Y., where he delivered a paper on the pulpwood resources of New York; and at the Ninth Vermont Wood Products Conference at Norwich University, Northfield, Vermont, where he described in general the research work of the Station and some of the practical applications of research results.

In company with Mr. Sims, the Director made a general inspection of the Adirondack Branch. He took advantage of a weekend in the Adirondacks to try the fishing, and well-nigh broke his wrist when he slipped off a slippery rock and fell into the Ausable River. No official report has been made on the number of fish caught.

Washington Assignment

Dr. Harper has been assigned the leadership of a Nation-wide survey of the organization and operation of the Forest Service's various research centers. This survey was requested by the Senate Appropriations Committee, which wants information on the need for each research center, the advisability of abandoning or consolidating certain centers, and the relationship of Forest Service research to State, local and private research agencies.

Dr. Harper expects to be busily engaged in this project for a month or more. He will be assisted by J. C. Rettie.

Conference of Forest Research Center Leaders

Leaders of the Station's research centers met at the Upper Darby headquarters on June 13 for a two-day conference on the problems and plans of work at the experimental forests. The major topic of discussions was "How to speed up operation of the experimental forests." Sims pointed out that, although we have gone ahead and have got some work started, there is an orderly and logical sequence of jobs that should be followed. We must put first things first to avoid back tracking and repetition, and that calls for early attention to the problem analyses. "The problem analysis is the real guts of your research program," Sims said. "It's the frame of reference we have to use in justifying every study we make." Dr. Harper instructed the research center leaders to set deadlines for their problem analyses and to get them completed as soon as possible. He stressed, too, that the problem analyses are chiefly useful in arriving at and formulating our program of research.

With an approved program of research, the next step is the organization of experimental forests, and the assignment of areas in them to research uses. Sims pointed out some of the uses of the land that must be planned for: (1) cutting practice level plots, (2) farm woodlots, (3) pilot plant compartment studies, (4) natural areas, and (5) areas reserved for future studies.

On most experimental forests a set of cutting practice level plots would be the next step. The Director laid great emphasis on the value of the CPL plots for training our own men in the application of the several levels of practice, and on their wide usefulness for demonstration purposes. "These plots will be one point where you can take somebody to, and in the space of a few acres and a few minutes focus attention on one of our biggest problems and show them what we are trying to do."

Toward the end of the conference Dr. Harper explained the reappraisal of the forest research program in which he is now engaged and assigned research leaders and staff officers to gather data for certain states and on certain subjects.

Administrative and fiscal problems, I. and E. work such as show-me trips, publications and pending forestry legislation were also discussed.

QUARTERLY REPORT — EDITOR

APRIL-JUNE 1949

by E. vH. Larson

STATUS OF PUBLICATIONS

Published During Quarter

Carter, Roy M.

1949. Byproducts from mill waste.
Vt. Bur. Indus. Res. Rpt. of 8th Vt. Wood Prod. Conf.
(1948): 7-17.

Cook, David B., and Sims, Ivan H.

1949. Beech utilization and management problems and possibilities.
Soc. Amer. Foresters Proc. 1948: 86-90.

_____, and _____

1949. Beech utilization and management problems.
Forestry Chron. 25 (1): 15-20.

Flood Control Survey

1949. Tentative report on flood control survey of the Connecticut River watershed. (For review purposes only.) Northeast. Forest Expt. Sta. 151 pp., illus. (Processed.) Upper Darby.

Forest Survey

1949. Forest Survey field manual for the Northeastern States.
(Rev. Ed.) Northeast. Forest Expt. Sta. 118 pp., illus.
(Processed.) Upper Darby.

1949. Forest statistics for northern New Hampshire.
Northeast. Forest Expt. Sta. Forest Survey Release 3. 36 pp.
(Processed.) Upper Darby.

1949. Forest statistics for Hancock County, Maine.
Northeast. Forest Expt. Sta. Forest Survey Release 4. 30 pp.
(Processed.) Upper Darby.

1949. Forest statistics for southern New Hampshire.
Northeast. Forest Expt. Sta. Forest Survey Release 5. 36 pp.
(Processed.) Upper Darby.

Harper, V. L.

1949. The wood-supply situation in New York State with special reference to wood for pulping. Northeast. Forest Expt. Sta. 13 pp., illus. (Processed.) Upper Darby.

- Jensen, Victor S., and MacAloney, Harvey J.
1949. Recovery of birch fifteen years after partial cutting.
Soc. Amer. Foresters Proc. 1948: 298-302.
- Little, S., and Moore, E. B.
1949. The ecological role of prescribed burns in the pine-oak forests
of southern New Jersey. Ecology 30: 223-233.
- Rutherford, William Jr.
1949. The Beaufort wind scale.
Lumber Camp News 11 (1): 16.
- Simmons, Fred C.
1949. Recruiting and training labor for woods work.
Northeast. Forest Expt. Sta. Paper 24. 16 pp., illus.
(Processed.) Upper Darby.
-
1949. Logging for profits.
Wood 4 (5): 26, 46-47, illus.
-
1949. New developments in harvesting sawlogs.
Forest Prod. Res. Soc. preprint of 1949 Proc. 10 pp., illus.
Madison, Wis.
-
1949. Mechanized logging.
Vt. Bur. Indus. Res. Rpt. of 8th Vt. Wood Prod. Conf. (1948):
22-25, illus.
-
1949. Sawmill techniques.
United Nations Sci. Conf. on Conserv. and Util. of Resources.
33 pp. (Processed.) Lake Success.
- Weitzman, Sidney
1949. The Fernow Experimental Forest.
Northeast. Forest Expt. Sta. 16 pp., illus. (Processed.)
Upper Darby.
- Westveld, Marinus
1949. Airplane seeding: A new venture in reforestation.
Soc. Amer. Foresters Proc. 1948: 302-311, illus.
-
1949. Airplane seeding: A new venture in reforestation.
Unasylva 3: 95-99, illus.
- Wright, Jonathan W.
Local genetic variation in silver maple.
Jour. Forestry 47: 300-302.

Submitted For Publication During Quarter

Bethlahmy, Nedavia, and Reigner, Irvin C.

Factors affecting the formation of concrete frost.
Trans. Amer. Geophys. Union.

Rogers, Earl J.

A short cut for scaling aerial photos.
Jour. Forestry

Simmons, Fred C.

Harvesting the forest crop in the Northeast and the Lake States. In Improvements in logging techniques in the United States, by George L. Drake, Fred C. Simmons, M. H. Collet, and E. E. Matson. United Nations Sci. Conf.

What's new in sawmilling?

Vt. Bur. Indus. Res. 9th Wood Prod. Conf.

Also submitted to Canad. Lumberman and Wood magazine.

Recruiting and training labor for woods work.
South. Lumberman

Stoeckeler, J. H., and McQuilkin, W. E.

Tree planting in the Northeastern States and Lake States Region. U. S. Dept. Agr. Farmers' Bul.

Whelan, Donald E.

A method for evaluating the hydrologic effects of land use on large watersheds. Trans. Amer. Geophys. Union.

Ready For Processing By Station

Doverspike, George E.

Preliminary survey of markets and prices of forest products in the Del-Mar-Va Peninsula. (Station Paper)

Harper, V. L., and Rettie, James C.

The wood-supply situation in New York State with special reference to wood for pulping. (Station Paper)

Rettie, James C., Banks, Wayne G., and Doverspike, George E.

Preliminary survey of the marketing of farm woodland products in the northern New England States. Northeast. Forest Expt. Sta. Paper 25.

Williams, Ellis T.

Forest insurance.
Northeast. Forest Expt. Sta. Paper 26.

In Process Of Or Awaiting Editing

Carter, Roy M.

The costs of poor kiln drying.
(Station Paper)

Rettie, James C., and Ineson, Frank A.

The Otsego Forest Products Cooperative Association of
Cooperstown, N. Y.: an evaluation. U. S. Dept. Agr.
Misc. Pub.

Estimates of bark supply in the Northeast.
(Station Paper)

Simmons, Fred C.

Integrated logging.
(Station Paper)

Being Reviewed

Barracrough, Solon, and Rettie James C.

Ownership status of small private forest-land holdings in
23 New England towns.

Filip, S. M.

Thinning young oak stands for small mine timbers--at a profit.
(Station Paper)

Forest Survey

Forest statistics for the southeastern section of West Virginia.
(Forest Survey Release)

Forest statistics for the Monongahela section, West Virginia.
(Forest Survey Release)

Hough, A. F.

Reforestation of old burns may be aided by chemical control
of herbaceous and shrubby growth.

Persistence of eastern hemlock and American beech in a virgin
forest on the Allegheny Plateau.

The forestry program of the Otsego Forest Products Cooperative
Association, 1937-48.

Husch, Bertram

Fuelwood consumption in New Hampshire.

Little, S., and Moore, E. B.

Effect of prescribed burns and logging on the reproduction of
shortleaf and pitch pines.

Somes, H. A., and Moorhead, G. R.

Mortality, basal scarring, and growth of prescribed-burned oak-pine stands of southern New Jersey.

Wright, Jonathan W.

Holly hybridizing techniques.
Amer. Holly Soc. Proc.

Returned To Author For Revision

Camp, H. W., and Bickford, C. A.

Use of binoculars with mil scale as a training aid for estimating form class. (Station Note)

Dill, H. W., Jr.

Soil-cover data for the Allegheny watershed.

Little, S.

Ecology and silviculture of whitecedar and associated hardwoods in southern New Jersey. (Ph.D. thesis, for publication by Yale Univ.)

_____, and Moore, E. B.

Mechanical preparation of seedbeds in converting oak-pine stands to pine.

McQuilkin, W. E.

Tests of preservatives for cloth nursery-bed covers.

Flood Control Survey

A bibliography on frost.
(Station Paper)

Wright, Jonathan W.

Pollen dispersion of some forest trees.

PRINTING PLANT, CLASS A

In line with recent changes in publication policies, the Station has been authorized to operate a Class A printing plant.

The new status will mean few physical changes in the operation of our present processing section. However, our work in preparing material for publication will be closely coordinated with other printing functions of the Forest Service. The purpose of this is to insure that all printing jobs are done in the most economical manner. Whereas the use of a multilith machine is the most economical method for a greater part of the material we publish, some large jobs may be printed more cheaply by letterpress. When such jobs are authorized, they will be done by the Government Printing Office.

HELPING THE CARTOONISTS

Some time ago, Ed Nofziger, author of the popular "Joe Beaver" cartoons (and formerly an employee of the Northeastern Station), asked the Forest Service for some help. He needed fresh ideas for his cartoons.

Station personnel provided several dozen ideas, and Nofziger has already used some of them. The Joe Beaver releases of June 14 and June 18 were credited to the Station.

J.A.R. DISCONTINUED

Publication of the Journal of Agricultural Research will be suspended after the issue of June 15, according to an announcement from M. C. Merrill, Department chief of publications. The reason given is "lack of sufficient operating funds."

QUARTERLY REPORT -- ADMINISTRATIVE SERVICES

APRIL-JUNE 1949

by G. A. Cashion and R. M. Kendall

ACCOUNTING

Due to the special importance of accurate records of financial balances and numerous reports due at the end of the Fiscal Year an effort has been made by all members of the Administrative Services Section to keep current in all phases of payrolling, purchasing, vouchering, and accounting. This problem is made more difficult with the warm weather, good travel conditions, and increased activities in field programs.

PAYROLL PROCEDURE

Detailed procedures of maintaining leave records on Form 26 and showing of essential service month information for temporary and WAE employees on that form have now been worked out. Complete transfer to the Form 26 leave procedure and discontinuance of the Form 1137 leave records will be accomplished effective with the payroll period beginning June 26 and ending July 9, 1949. This innovation will permit earlier audit of payrolls by the General Accounting Office.

PROCESSING

Something new has been added to our processing room, a plastiphoter. This instrument will enable us to reduce considerably the cost of making photo-plates for multilith work. Formerly it was necessary to buy both negatives and plates. The new machine eliminates the necessity of purchasing plates. We now purchase the negatives only and make our own plates therefrom through the use of the plastiphoter. Negatives can be saved and reused.

TRAINING

A new clerk for the White Pine Research Center was given approximately 3 weeks training in the Administrative Services Section before reporting to Alfred, Maine, for duty. He also spent some time with Price at Bethlehem for further training.

INSPECTIONS

Fiscal and safety inspections completed during this quarter have been as follows:

6/6-7/49	-	Kendall	-	Anthracite
6/16-17/49	-	Kendall	-	Chesapeake
6/20/49	-	Kendall	-	Coastal Oak Pine

QUARTERLY REPORT -- MENSURATION AND BIOMETRY

APRIL-JUNE 1949

by C. A. Bickford

ESTIMATION OF GROWTH

The estimation of growth for New Hampshire from forest survey data was completed. The general procedure used is that of stand projection under which numbers of trees by species and d.b.h. after 10 years are estimated. A normal distribution of diameter growth was assumed and from this means by species groups and their standard errors, proportions moving 0, 1, 2, 3,.....classes were calculated.

In previous estimates it has seemed necessary to assume either (1) equal growth of identical trees or (2) equal growth by trees of the same initial d.b.h. This dilemma was not met in these New Hampshire estimates as diameter growth data were available for two consecutive decades and it was only necessary to assume the average trend is constant by species groups.

The problem of growth in bark was met by fitting regression equations by species groups for estimating d.b.h. from d.i.b. at BH and assuming it to apply after ten years, adding estimated growth in d.i.b. to present d.i.b.

Adjustment was made for mortality on the basis of the data collected by the field crews. This adjustment may be the weakest part of the estimate owing to the difficulties of accurately recognizing trees that died in the last five years.

These procedures were applied to 10 species groups and summed to give estimated total growth for the State. These totals were also broken down by forest type and stand class to give estimated average growth per acre by these classes.

The sampling error of total estimated growth in cubic feet was calculated on the basis of the variance by diameter classes. It turned out to be 4,360,000 cubic feet which is 2.34% of estimated total growth for the State.

SURVEYS

Earl Rogers has come up with a proposal for modifying current procedure in aerial photography that has tremendous possibilities. In the Forest Survey, the greatest element of expense comes from actual field examination of ground plots. It is unlikely that they can ever be completely eliminated but anything that promises a material reduction in their number also promises a sizable reduction in the cost of such surveys. The problem in use of such photos by Flood Control Surveys or in the management of forest land is similar.

Rogers proposal is to fly a portion of the area at an elevation that would result in a photo scale of approximately 1:500 instead of the 1:15840 now favored by forest survey. This larger scale should nearly eliminate errors of classification on new photographs and also permit accurate measurement of some attributes of individual trees, and plots. Such results are bound to reduce the number of required ground plots. If the reduction is significant there is also a reduction in cost.

Complete coverage is not provided by this portion itself and use of such a system might be limited to resurveys. But we were advised that a sample flown at 1:500 plus completes coverage at 1:40000 would be cheaper than complete coverage at 1:15840.

QUARTERLY REPORT -- FOREST MANAGEMENT

APRIL-JUNE 1949

by I. H. Sims

Office work consumed most of the time during the quarter although every member of the division got into the field. Jobs that marked progress included:

Assistance on or review of working plans for the Anthracite (brush poisoning and planting, use allocation of Pocono Experimental Forest, and compartment studies); Adirondack (tree poisoning); Chesapeake (CPL plots); Mountain State (compartment studies); White Pine (CPL plots and compartment studies); Genetics (hybrid poplar tests); Penobscot (tree classification, growth studies); and Hopkins (CPL plots, farm woodlot study).

Review of Penobscot and Winnepesaukee Problem Analyses.

Help for the Mountain State on preparation of a guide booklet for the Fernow Experimental Forest.

Assistance to the Mountain State and Adirondack on preparation and clearance of memoranda of understanding.

Review of manuscripts (but not enough of them).

Prepared and issued a suggested system of record keeping for compartment studies on experimental forests for review by the Branches, and prepared a revised draft in the form of instructions, after consideration comments and suggestions received.

Worked with Fred Simmons of FUS on purchase of logging equipment for the several Branches that expect to begin cutting soon.

Clark accompanied McQuilkin of the Anthracite on visits to the American Chemical Paint Co. and the Asplundh Tree Expert Co. to learn more about the uses of herbicides for brush killing, and to arrange for cooperative tests on scrub oak with the American Chemical Paint Co.

Hough spent considerable time at Beltsville helping out on the analysis of data from a series of thinning plots in Virginia pine on Cedarville (Md.) State Forest, and on preparation of a working plan for CPL plots in Virginia pine.

Sims went to the White Pine and Anthracite Branches to help with preparation of working plans for CPL plots and compartment studies on the Massabesic and for planting site preparation studies in scrub oak. With Westveld he made a general inspection of the Winnepesaukee Branch, and of the Adirondack with Harper.

Westveld participated in the negotiations at Portland for the Penobscot Experimental Forest, and in a conference on spruce-fir growth at Bangor. He also began work on a summary of information on spruce-fir silviculture and management looking toward preparation of a comprehensive bulletin on the subject.

QUARTERLY REPORT — FOREST ECONOMICS

APRIL-JUNE 1949

by J. C. Rettie

Rehabilitation Of Fire-Damaged Lands In Southwestern Maine

A field survey to check the current conditions of natural regeneration and to obtain a reasonably accurate estimate of the acreage that cannot be expected to regenerate to desirable species was completed. This involved the examination of some 355 field plots scattered throughout the burned-over area.

The entire burned-over area included some 130,000 acres of forest land. Of this total, some 16,500 acres have a reasonably adequate growing stock that escaped being killed in the fire. Another 27,900 acres appear to be fairly well stocked by seedlings of desirable species that have come up since the fire. An additional 28,900 acres appear to have pretty good chances for natural restocking in the near future by the seed trees that are available. This makes a total of 73,300 acres that have reasonably good chances for natural regeneration.

The remaining 56,700 acres have virtually no present growing stock of desirable species and no such seed sources. Most of it will grow up to worthless brush if left as is. The acreage on which planting and other forms of artificial regeneration appear to have reasonable chance of success add up to about 34,000 acres. Another 5,000 acres are in hayfields and open pasture areas that will not again be used for agriculture. The total area that should be considered as potentially plantable thus amounts to about 39,000 acres.

A Station Paper summarizing findings of the field survey has been drafted and is now being reviewed. This completes the work on this project—at least for the present.

Appraisal Of The Otsego Forest Products Cooperative Association

The second draft of this report has been completed and mimeographed for circulation to a Washington Office board of review. When this process is completed, the report will be submitted for publication as a Department of Agriculture bulletin.

Ownership Status Of Small Private Forest-Land Holdings In 23 New England Towns

This study has been brought to completion. A Station Paper summarizing the results has been prepared and is now undergoing review and final check.

Marketing And Prices Of Farm Woodland Products

The respective responsibilities of the several state agencies collaborating in the proposed project for market and price surveys in West Virginia have been clarified. The Station staff gave assistance in drawing up the reporting forms that are to be used. The project is now awaiting final approval from Washington. Further assistance in the initial field work of the county marketing agents will be given as soon as the project is started. Station staff will also assist in the preparation of the first reports. Thereafter, the job will be taken over by the cooperating state agencies.

Local forestry interests in West Virginia have been much concerned about the need for development of market outlets for the large quantities of low-grade wood and thinnings that should be taken out of the farm woodlands. Proposals for the development of charcoal production in the "Connecticut" cinder block kiln have been made. Several woodland owners have been near the point of installing one or more of these kilns with the hope that the large chemical industries of the Kanawha Valley would buy the product. The interest in this project clearly justified a brief survey of the actual charcoal market possibilities. Investigation on the ground shows, however, that charcoal has priced itself out of a market in the chemical plants of the Kanawha Valley. Several plants that formerly used large quantities of wood charcoal have now turned to other sources of carbon. It thus appears certain that there is a possible chance for charcoal to re-establish itself in the Kanawha Valley chemical industry market. Domestic and camp ground consumption of charcoal in this area is too small to justify the building of kilns. While the results of this survey are all on the negative side, it probably has prevented the initiation of the kiln project that would very probably have failed.

Considerable time was spent in locating several hardwood sawmills whose owners are interested in testing out the hardwood log grading system developed by the Forest Products Laboratory, preparatory to putting it to use in their purchase of raw materials. Several such mills have been found. Working plans and cooperative arrangements for one or more of these test-demonstrations are being developed.

Two reports on this project are now in the processing stage. These are: "Survey of Markets and Prices of Forest Products on the Del-Mar-Va Peninsula", and "Preliminary Survey of the Marketing of Farm Forest-Products in Northern New England". Both will be released in the near future.

The Wood-Supply Situation In New York State With Special Reference To Wood For Pulping

The economics staff assisted the Director in the preparation of a paper on the above mentioned subject. He presented it at a meeting of the Empire State section of the Technical Association of the Pulp and Paper Industry. It will now be issued in the Station Paper series.

QUARTERLY REPORT -- FOREST SURVEY

APRIL-JUNE 1949

by H. W. Camp and R. H. Ferguson

The months of April, May, and June were particularly busy ones for the Forest Survey group. Planning of work and preparation of statistical reports were the items receiving the most attention. Plans were initiated for cooperative field work with the State of Maryland to obtain game-habitat data along with forest inventory data. The proposed National forest survey manual was reviewed, and our comments were presented at a conference with the Forest Economics group in Washington. The Forest Survey field manual for the Northeast was revised. A training conference for field men was held in cooperation with the Maryland Forest Service at New Germany, Maryland. Plans were prepared for commodity drain estimates for Vermont and West Virginia, including surveys of consumption of fuelwood, fence post, and miscellaneous farm wood use. Inventory field plot work was continued in New York and West Virginia.

INVENTORY

The inventory field plot work for West Virginia is practically completed. There are approximately 60,000 acres of forest land in Hardy County that will be completed as soon as aerial photos are obtained. In New York State the field crews concentrated on photo interpretation to provide a backlog of field plots for summer work. Because of this, fewer field plots were inventoried in the field during this quarter than usual.

After several conferences with State officials a cooperative agreement with the State of Maryland, providing for a joint forest and game-habitat survey, was executed. The cooperative survey was officially initiated in Maryland on June 20 by Caporaso and Lundin. The ownership study for the State was completed and photo interpretation was started for Garrett, Washington, and Allegany counties. A conference was held in Upper Darby on June 9 with representatives of the Maryland Department of Research and Education to work out details for the game-habitat portion of the survey. Discussion involved the type of data to be collected, construction of a field form, and ways of compiling the data.

New aerial photography was contracted for by the State of Maryland. This photography will be on infra-red film at a scale of 1:20,000, and will cover 7,578 square miles. When flying is complete, the entire State will be covered with aerial photography less than two years old.

Through FMA, Pennsylvania has contracted for 21,259 square miles of new aerial photography. This is the first step toward providing up-to-date photography for Pennsylvania. The remainder of the State should be covered within the next two years.

The preliminary draft of a National manual for Forest Survey was reviewed in detail. Our comments and recommendations were presented by Ineson and Camp at a conference with Dr. Crafts, and Messrs. Garver and Cowlin in Washington on April 8. In order that the Forest Survey field manual for the Northeast would be in agreement with the National manual, and to consolidate the many amendments made since the issuance of our manual in 1947, George Mullin and Alessio Caporaso were detailed to Upper Darby during May to revise our field manual.

COMPILATIONS

Tabulations of forest area and timber volume were completed for three more forest survey releases, all in West Virginia: Monongahela Section, Southeastern West Virginia, and the Cumberland Mountains. Tabulating cards for the entire State of Vermont have been punched, and will be ready for tabulations the first week in July.

Purchase of a special wiring unit for the printing-multiplying punch is under way. When this unit is received, tabulating cards will be used for obtaining the sum of numbers and the sum of their squares. This will facilitate the calculation of standard errors.

GROWTH AND DRAIN

Growth predictions for New Hampshire were completed in June. Total annual growth, excluding commodity drain, is estimated to be 465,264,000 board feet for saw-timber trees and trees becoming saw-timber size during the year. Total annual growth of all trees 5.0 inches and larger, and of trees which become 5.0 inches during the year, is estimated to be 190,698,000 cubic feet. For all stands, the annual growth per acre is 99 board feet for saw-timber trees, including ingrowth, and 41 cubic feet per acre for all trees, including ingrowth.

A woods waste and tree measurement study was completed for all of New York except the Adirondacks.

REPORTS

Three more Forest Survey releases have been distributed. No. 3, "Forest Statistics for Northern New Hampshire"; No. 4, "Forest Statistics for Hancock County, Maine"; and No. 5, "Forest Statistics for Southern New Hampshire".

Two more releases are being reviewed prior to processing. These are the Monongahela and the Southeastern Section of West Virginia.

PERSONNEL

Bert Husch, who worked on the forest drain for New Hampshire, has left to teach at the summer forestry camp for the New York State College of Forestry. Alvin Wilson, who has been on educational leave, has transferred to the Intermountain Forest Experiment Station. Robert Wray was transferred from field work in West Virginia to the Upper Darby office to write up Forest Survey releases and assist Ferguson in compilations.

On June 13 the following forestry students reported for work as field assistants for the next three months: Norman Gardner (Yale), Thomas Ginn (University of New Hampshire), Louis Hamill (Syracuse University), Lawrence Hannon (University of Massachusetts), William Lane (University of Massachusetts), Richard Lundin (University of Connecticut). Lundin and Ginn were temporarily assigned to work in Maryland and West Virginia respectively. Later on they will work in Pennsylvania. The four remaining students were assigned to work in New York.

Mrs. MacKinnon, one of our statistical clerks, has been on sick leave for 2 1/2 months. She will probably return to work early in July.

A training conference was held on the Savage River State Forest, New Germany, Maryland, from June 14 through June 16. A total of 34 men attended; 22 from the Forest Service, and 12 from the Maryland State Forest Service and the Department of Research and Education. The general objectives of the conference were to review the field section of the revised field manual in detail, to secure uniform interpretation of all instructions both old and new, and to train new men in forest inventory techniques.

PLANS FOR THE NEXT QUARTER

1. Surveys of the fuelwood and fence post consumption will be completed for West Virginia and Vermont.
2. Game-habitat survey data will be gathered in the four counties in West Virginia for which forest survey field work had been completed before the game-habitat survey was initiated.
3. Tabulations of game-habitat survey data for the Conservation Commission of West Virginia will be completed.
4. Forest Survey releases to be issued:

Monongahela Section, West Virginia
Southeastern West Virginia
Cumberland Mountains, West Virginia

5. Forest Survey releases to be prepared:

New Hampshire State
Southern Vermont
Northern Vermont
Potomac Section, West Virginia
Delaware, Otsego, and Schoharie Counties, New York

QUARTERLY REPORT -- FLOOD CONTROL SURVEYS

APRIL-JUNE 1949

by Arthur Bevan

GENERAL

Spectacular flash floods occurred in the Potomac River watershed in Virginia and West Virginia in June. These floods caused over \$5,000,000 of direct damages and 12 lives were lost. Indirect damages will probably exceed the direct damages as considerable areas of valuable bottom land were destroyed by scouring and deposition. Newspaper stories of the floods stated that they originated in the National Forests. Slips, slides, and washouts occurred in both open and forest land on steep slopes. A study is being made of the causes of slides and washouts, and the contribution to flood water from forest lands. First impressions indicate that secondary roads, farm roads, haul roads, skid roads and trails, with no or inadequate water-disposal structures or treatment, were heavy contributors to both accelerated runoff and debris, mud, and rock flows which caused such a large percentage of the damages. Following field studies a report will be prepared for the Washington office.

Personnel

Samuel Hutcheson was transferred from the hydrology section to the Massabesic Branch Station at Alfred, Maine, as administrative clerk.

Surveys And Preliminary Examination Reports

The tentative report on the Connecticut River survey was submitted through the Regional Forester to state officials in Connecticut, Massachusetts, New Hampshire, and Vermont. Meetings have been held with state officials in all states except Vermont. In general the report has been well received and we have general concurrence from Connecticut and New Hampshire. A few items remain to be worked out with Massachusetts and it is expected that a meeting with state officials in Vermont will be held soon. It is anticipated that this report can shortly be put in final form for submission to Washington.

The Merrimack, Allegheny, and Monongahela survey reports are still in various degrees of completion. The Merrimack report is in the process of final polishing and a few loose ends are being caught up. Report writing on the Allegheny is just starting. Very little progress has been made on the Monongahela awaiting completion of work on the Allegheny report.

Advance studies and the work outline on the Upper Susquehanna watershed have been completed. The area to be surveyed includes all of the Susquehanna Basin above the confluence of the North Branch and the Chemung Rivers. Work plans are completed and field work is just getting under way.

Status of surveys for which the S.C.S. has primary responsibility is as follows:

The Youghiogheny report has been returned from Washington for revision, primarily of the hydrologic evaluations. The Lehigh report is almost completed to the rough draft stage. We have received no further word concerning the Roanoke report and assume it is still in the process of revision. A preliminary examination report of the Delaware watershed was completed and submitted to Washington. We have approved the work outline for the Delaware River and field work will start shortly. We expect to assign Ted Flint and John Zerbe to this important survey.

OTHER ACTIVITIES

An analysis was made of the inventory phases of the Allegheny watershed to determine adjustments which should be made in our techniques for future surveys. Work has been started on the development of unit costs for program measures. In the past costs were determined on each survey. A considerable saving in time and labor will result. An analysis of humus depth observations is now underway. This work includes the measurements obtained on four surveys. The purpose is to determine the feasibility of reducing field work by utilizing humus data obtained, on new watersheds.

A comprehensive progress report has been completed on the Allegheny soil moisture study. This report is in process of review. Certain conclusions have been drawn from the results of this study. Analysis of percolation rates and storage capacities in this watershed showed that land cover and use primarily affect the upper soil horizons while in the lower horizons the principal factors affecting soil moisture are texture and drainage. Within the forest, grazing resulted in a greatly reduced rate of water movement and amount of detention storage but this effect did not extend below the A horizon. The effect of cover and use as between forest and open land was greatest in the A horizon and diminished through the B until the C horizon was reached where no appreciable differences existed between the soil moisture values regardless of cover or use.

In April we participated in the general integrated inspection by Messrs. Grainger and Spillers in those phases dealing with watershed management and flood control.

A number of meetings and conferences were attended. We arranged and conducted an exhibit on watershed management at the Ohio Valley Improvement Association meeting at Pittsburg. Other important meetings were the annual meeting of the Interstate Commission on the Delaware River Basin, a meeting of the humus classification committee at the Pack Forest at Warrensburg, New York. Trimble, who is a member of this committee for the N.E. Working Group on Forest Soils, attended. A meeting of conservation interests and state officials at Fairmont, West Virginia, was attended. The purpose was to initiate steps to develop a flood control program for Buffalo Creek (Monongahela watershed) above the town of Mannington.

QUARTERLY REPORT

FOREST UTILIZATION SERVICE

April 1 - June 30, 1949

TIMBER CONVERSION

Beech Series

In response to an invitation issued by this Station, the Northeastern Technical Committee on the Utilization of Beech was organized at a meeting held at the New York State College of Forestry, Syracuse, N. Y., April 19. In addition to the Station which was represented by Dr. Harper and Fred Simmons, representatives of the following agencies attended: University of Maine, Pennsylvania Department of Forests and Waters, University of Massachusetts, Region 7 - USFS, West Virginia University, Penn State College, Yale University, New York State Conservation Department, New York State College of Forestry. Cooperating in the project, but not represented at the meeting, are: Connecticut Agricultural Experiment Station, N. H. Engineering Experiment Station, Vermont Bureau of Industrial Research, University of Connecticut, Massachusetts Institute of Technology and the Forest Products Laboratory.

Committee discussions indicated that proportion of beech in Northeastern stands is steadily increasing because of a general industry discrimination against it. On the other hand, it is known that beech can be and is being used to good advantage in many ways. Consequently, the idea of pulling together and publishing available knowledge on both the management and use of this species appears to be a timely and worthwhile project. The committee developed a list of 24 subjects for papers. Assignments of these were made and have subsequently been accepted by members of the interested organizations. A Working Committee was set up to coordinate the work, to help the authors complete their assignments, and to provide or secure competent technical review for all papers in the series. The Committee is composed of F. C. Simmons, Chairman, Prof. Fred Wangaard of Yale, Ray Hoyle of New York State College of Forestry, Dave Cook, N. Y. State Conservation Dept. and Fred Malcolm, Forest Products Laboratory.

Although most of the information in this series will be compiled from available knowledge, some additional tests are contemplated. To this end the New York State Conservation Department arranged for shipment of logs to the Forest Products Laboratory for veneering, gluing and seasoning tests. FUS also made arrangements with the Pa. Dept. of Forests and Waters and Consulting Forester Alan Bratton to secure some beech squares for bending tests at Yale.

Wood Burning Furnace

The wood burning furnace, tests of which were described in our last two progress reports, is now on the market, and an aggressive sales campaign is being carried out. It is now called the "Woodomat" and the manufacturer is the Pantex Mfg. Co., Pawtucket, R. I. The difficulty of smoke coming out of the loading door when it is opened for refueling has apparently been solved by installation of an automatically operating bypass into the smoke pipe, which functions whenever the fuel door is opened. A complete description of this furnace is given in the recently published Bulletin #27 of the Northeastern Wood Utilization Council.

Chain Saw Changes

Word has been received from the McCulloch Co., Los Angeles, Calif., that two of the changes in construction of their saws recommended by Northeastern FUS, and mentioned in our Fourth Quarter, 1948 report have now been adopted. One is the addition of a chain oiler, which is now available as an extra for both old and new saws. The other is the provision of a special chisel type chain for sawing hardwoods. This is now in production as the "F" type chain (the standard McCulloch chain previously supplied and recommended for softwoods is designated the "M" type). The new F chain has stronger flatter type cutting teeth, and lesser clearance on the depth gage, which is positioned closer to the cutter for greater accuracy in stabilizing the depth of cut. The Company is also putting out a more nearly conventional type of chain, designated as the "X" type, with side cutters and center rakers. All are interchangeable both in size and price.

Logging Equipment for Experimental Forests

FUS helped the Station's Division of Forest Management select, and Administrative Service set up specifications for, the purchase of logging equipment for the Experimental Forests. Included were two light two-man chain saws, a logging sulky, hand tools and wire rope fittings. FUS also provided plans for the construction of a guard for the operator and a bunching boom for the logging tractor on the Massabesic Experimental Forest in Maine.

Woodsmen's Field Day

Fred Simmons met with a Committee of northern logging operators to help develop plans for a Woodsmen's Field Day to be held at Municipal Park, Tupper Lake, N. Y., August 13, under the sponsorship of the Woodsmen's Club, Old Forge, N. Y. This Club which includes lumberjacks from Pennsylvania to Maine has as a Secretary Rev. Frank Reed, publisher of the Lumber Camp News. The plans call for an equipment demonstration and show-- this to be in charge of John Stock, Forester for the Conifer Lumber Mills, Conifer, N. Y. There will also be contests including bucking with chain saws, cross cut saws and bow saws, felling accuracy, log birling, chopping and horse pulling. Jack Curry who is Secretary of the Organization Committee will also be in charge of the last named event.

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Wood Waste

Field Survey

The Northeastern Wood Utilization Council under a grant from the Federal Reserve Bank of Boston has completed the field work in connection with a survey of primary and secondary wood waste concentration points in New England. The work revealed that there are at least 39 communities in the territory in which more than 20 tons of wood waste are accumulating a day, and therefore offer possible locations for processing plants. The data secured will form the basis of discussion at a conference on waste utilization to be held at Harvard University next fall. This conference will give special attention to the possibilities of wallboard and hard-board manufacture.

Briquetting Machine

The operation of a machine for compressing wood waste into stoker fuel was observed. This machine which is being developed by Walter Letts, a lumberman at Northville, N. Y. is now being operated on headsaw sawdust but hogged slabs and edgings could be used. The raw material is run through a hammer mill and dried to a moisture content of 10 to 14 percent by blowing through two cyclones. It is then fed into a series of 8 cylinders and compressed by a series of piston strokes to form a continuous extruded cylinder 1 inch in diameter. The cylinder is then chopped automatically into chunks 1 or 2 inches in length. The machine differs from similar ones developed by Wood Briquettes, Inc. at Lewiston, Idaho in that a piston instead of a screw feed is used. One machine can process about 10 tons of material per day. The machine is not yet ready for commercial operation, the major remaining problem being that of drying raw material to a uniform moisture content. The present machine has been manufactured by the Sandy Hill Iron and Brass Works, Fort Edward, N. Y. for Mr. Letts. Information on the cost of the installation or the product is not presently available.

Sawdust for Steel Smelting

The Adirondack steel company which has been seeking a source of 60 to 80 tons a day of green softwood sawdust for use in its smelting operations has found a sufficient supply in the softwood sawmills in Warren and Essex Counties, N. Y., to which they were referred by Northeastern FUS. Rail transportation around the Adirondack Mountains, however, is believed to be too expensive, and they are now trying to work out a method of truck haul across the mountains. Information on methods and costs of similar hauls on the Pacific Northwest have been supplied.

Charcoal Production

A preliminary report on the current status of the charcoal industry in the Northeast has been compiled preparatory to a resurvey of the industry by Beglinger of the Laboratory and Simmons from this Station, scheduled to be made this fall. The general situation is that the wood distillation plants are in difficult straits, primarily due to the competition of synthetic producers of methanol, acetate, and acetic acid. The production costs of the natural products seem to be two to three times greater than costs of the synthetics. Consequently many distillation plants are closing down, and some are being dismantled.

At the same time the market for hardwood charcoal, in this territory at least, remains relatively strong. This demand is being only partially met by imports from other Regions and the six big charcoal kiln producers, who have a total installed capacity of 2461 cords. Small kilns, many of them of the square cinder block type developed by the Connecticut Agricultural Experiment Station, are being erected by a number of small sawmill men and farmers. The Station is erecting a two cord kiln of this type on its Massabesic Experimental Forest at Alfred, Me., which will be available for studies of handling wood into and charcoal out of the kiln. Concurrently, studies of the problems of mechanizing wood procurement will be made.

Staybwood

A Philadelphia custom drying concern, with equipment for impregnating wood with resins under heat and pressure, in experimenting with an impregnation treatment with a microcrystalline paraffine wax, were surprised to find that the weight of the pieces of wood after treatment was less than oven dry weight of the wood alone before treatment. Analysis of the treatment schedule by Northeastern FUS and Forest Products Laboratory disclosed that temperatures as high as 400 degrees, Fahrenheit, were being used, and that a form of Staybwood was being produced. The company has now produced some Staybwood without wax, and is investigating possible markets for it.

Wood Molasses

Plant Costs

The Northeastern Wood Utilization Council has collected current information from equipment manufacturers and distributors on the cost of equipment for small plants for manufacturing wood molasses. Complete equipment for plants for processing 10 and 25 tons a day has been included. Estimates have also been made of cost of operating plants of this size. This information will be published in the form of a Bulletin of the Council.

Markets

Recent investigations have indicated that although the price of tanker lots of blackstrap molasses at Cuban ports is now quoted as low as 4 cents a gallon, farmers buying molasses in drums in New England are still paying as much as 35 cents a gallon for it. Part of this market price is freight charge. For example, freight rates on molasses from Boston to Northern Vermont amount to 87¢ per hundred weight or about 8¢ per gallon.

Feeding Tests

Feeding tests at the University of New Hampshire to compare the nutritive properties of blackstrap molasses and wood molasses were completed. The experiments involved determination of energy balance. Dairy heifers were fed a mixture of field cured grass legume hay mixed with pine wood molasses on one hand and cane molasses on the other. As a control, hay alone was fed. The test ran from August 1948 to March 1949. Twelve protein and energy deficiency balance experiments were made. The results of this work indicate that wood molasses is comparable to cane molasses as feed for dairy cattle. The full report has been submitted to the Journal of Dairy Science for publication.

SEASONING

Kiln Drying

Warping and Cupping

The Northern Lumber Co. of Poland, N. Y. has been having trouble with flat sawn beech, birch and maple. Particularly, lumber has been cupping after removal from the kilns. Since Forest Products Laboratory published information on stress relief supplied by FUS was not adequate to correct the condition, the Company through FUS arranged for a cooperative study by Mr. Rietz of the Forest Products Laboratory. Mr. Rietz checked the entire operation and found that the difficulties were not due to kiln operation for the Company had a competent kiln technician and modern well maintained kilns. No apparent cause was isolated but experiments designed to track down the trouble were suggested to the Company.

A Philadelphia concern which has been experiencing similar difficulties with black cherry felt that the difficulty might be due to the fact that the lumber is coming from relatively small trees. This Company was given names of several possible suppliers of material from larger timber.

Kiln Drying Associations

Joint meeting of the Northeastern and New England Kiln Drying Associations was held at Conway, N. H., June 17. There was a total attendance of about 50 including Mr. Rietz from FPL and C. R. Lockard of the FUS. Papers presented included the following: "Progress Report on Research with the FPL Experimental Kiln at the University of Maine", "Self Training for the Kiln Operator", "Dry Kiln Control Instruments."

Lauren E. Seeley, Dean of the College of Technology and Director of the Engineering Experiment Station, University of New Hampshire, spoke at the banquet on "Utilization of Wood Waste". In addition to business meetings, visits were made to several wood working plants in the Conway area. Mr. Marty Tolman of the Saunders Co., Norway, Maine was elected President of the Northeastern Association and Mr. George Manion of the Northern Lumber Co., Poland, N. Y. was elected President of the New England Association. Plans were made to hold a joint Fall meeting at Gardner, Mass.

PUBLICATIONS AND MEETINGS

Wood Machining Study

The final report on the cooperative study of wood machining in Vermont, entitled "Survey of Wood Planing and Turning Machinery in Vermont" has been published by the Vermont Bureau of Industrial Research. The report summarizes the results of a critical survey of wood planing and turning machinery in about 100 Vermont woodworking plants, and gives suggestions for the improvement of some of the conditions found. S. H. McIntyre of the Vermont institution is the author, and E. M. Davis of the Laboratory is given credit for technical review and added material. A limited number of copies are available for distribution from this Station or from the FPL.

Logging Supervision Series

The second in Fred Simmon's series of papers on the supervision of logging jobs, "Recruiting and Training Labor", was issued as Station Paper 24 in May. Permission has been given the Southern Lumberman to reprint this paper in an early issue. The value of this paper is indicated by the many requests for copies which are being received from woodworking industries and trade associations from many regions. Typical requests are those of the Northern Hemlock and Hardwood Mfrs. which telegraphed in from Duluth, Minn. for 100 copies; Region 8 of the Forest Service which wanted 75; Region 7, 113; Region 9, 80; the Dierks Lumber Co. of DeQueen, Ark. which asked for 10; and the North Carolina Conservation and Development Commission which requested 20.

Forest Products Research Society

Simmons' paper "New Developments in Harvesting Sawlogs" presented at the annual meeting of FPRS, Grand Rapids, was well received and a condensed version entitled "Logging for Profits" was published in the May issue of Wood.

Vermont Wood Products Conference

Simmons also presented a paper, "What's New In Sawmilling", at the Ninth Annual Vermont Wood Products Conference at Norwich University, May 27. This will be published in the Proceedings of the conference. Director Harper accompanied Simmons to this conference and also presented a paper on "What the Experiment Station is Doing for You." The conference was attended by about 80 representatives of the typically small wood using industries in Vermont.

Text on "Timber Harvesting"

The American Forestry Series text on "Timber Harvesting" has been announced by McGraw Hill Publishing Co. The author is Prof. A. E. Wackerman of Duke University. For Chapter 18, a discussion of Regional problems, Fred Simmons contributed descriptions of logging for the North Woods of New England and New York, for the woodlot region of southern New England and the Middle Atlantic States and for the Appalachian Mountain territory. Numerous photographs used throughout the text were supplied by Northeastern FUS.

GENERAL

The color film of the Cooperstown logging show was shown at the Grand Rapids Forest Products Research Society meeting and the Vermont conference. Simmons also showed it to the student body of the University of Michigan School of Forestry and Conservation at a special meeting between Forest Products Research Society and the Program Conference at the Laboratory. The film is now on loan to Central States Forest Experiment Station, and is scheduled for showing to a meeting of Allis Chalmers tractor dealers in July. Several other requests to borrow it have been received, but there is still considerable open time available for other engagements.

Among the many visitors to this office, was Theodore Wegelius, Prof. of Forest Technology, University of Helsinki, Finland and Edward N. Murray of the Young Iron Works, Seattle, Wash. Prof. Wegelius was interested in American logging techniques and Mr. Murray in cableway development.

PERSONNEL

C. R. Lockard entered on duty as Chief of Northeastern FUS on June 1 transferring from the Southern Forest Experiment Station where for the last four years he filled a similar position.

QUARTERLY REPORT -- HOPKINS MEMORIAL EXPERIMENTAL FOREST

APRIL-JUNE 1949

by Frank E. Cunningham

HARDHACK CONVERSION STUDY (H-1)

All site preparation treatments described in earlier reports were completed during this period. Of the various treatments employed, harrowing with a bog harrow proved to be the most satisfactory for effective site preparation. The brushy hardhack cover was knocked down and partially covered over, the valuable top soil remained in place, and the ground surface was made quite plantable. The resulting workability of the soil favorably affected planting rates. Enough ground cover remained or will develop during the current season to give adequate protection to the planted stock against such dangers as frost heaving.

Bulldozing cleared the area quite effectively of hardhack and red maple, but, in process, removed the thin layer of organic top soil and exposed the heavy clay subsoil. During the prolonged drought and hot spell the bulldozed areas baked out quite hard. It is expected that considerable heaving will develop on the bulldozed areas.

Burning, while the least costly of the treatments applied, was also the least satisfactory. Little uniformity of burn was obtained. Great difficulty was experienced in obtaining a satisfactory burn. Many of the hardhack stems were killed in the process, but the dead stems presented a mechanical obstruction to planting. Planting rates on burned over areas were nearly as great as on the areas which had had no site treatment prior to planting. Dense sprouting of hardhack has developed in the burned over plots.

Scalping, preceded by brushing out lines, gave fairly satisfactory results, but frequent releasings will be necessary to maintain the planted stock.

As for relative costs, none of the treatments employed to date could be recommended as being economically feasible on an extensive scale. Costs were \$103.00 per acre for bulldozing, \$95.00 per acre for harrowing, \$72.00 per acre for brushing and scalping, \$45.00 per acre for burning. All of these are based on 100% coverage of the area to be planted. A possibility exists for reducing these costs considerably, especially for harrowing and bulldozing, by treating strips at predetermined intervals for extensive reconversion work of this nature.

All planting in this study was completed. Efforts were made to obtain relatively large size planting stock but the nursery supplying the stock had no large size stock available. We were therefore obliged to use much smaller stock. Except for the European Larch, the quality of the stock used, was excellent. The larch stock was quite erratic. Greater

losses are expected in the larch than in the other species used. The other species were Red Pine, Norway Spruce, and Red Oak acorns. Spot checks on survival indicate promising results.

GENETICS

During the quarter plantings were made in duplicate of 25 hybrid poplar clones for clonal tests and 50 clones for sapling clonal tests for the genetics project, following the plowing, harrowing and disking of the areas selected for the genetics project.

Subsequent to planting, cultivation work was carried on in the early part of June. Lacking our own cultivation equipment, efforts were made to hire the work done. After much search, a single-horse cultivator was employed which proved rather light for the job. Finally, a roto tiller was employed which did a good job as far as it went, but it broke down before the job was completed. We have now obtained the use of a wheel tractor equipped with hydraulic cultivator. This is doing a good job and we hope to have the cultivation work completed this week.

SMALL WOODLAND OWNERSHIP MANAGEMENT STUDY (H-2) AND CUTTING PRACTICE LEVEL PLOTS (H-3)

No further field work was done on these studies this quarter. A local survey of market possibilities for products from these studies showed that the market for forest products in this vicinity is at low ebb. Cordwood (fuel wood) is practically a drug on the market. Birch boltwood for novelty and birch veneer, to meet local specifications, has to be winter cut. Pulp wood peeled, can be sold, but demand is primarily for spruce but some hardwoods are tolerated. Demand for softwood logs is fairly good (of which we have none), demand for hardwood logs is spotty, confined chiefly to red oak and sugar maple. Prices are down considerably but labor continues to be fairly high.

MAINTENANCE AND IMPROVEMENTS

In late May and early June, after a prolonged drought of 25 days without measurable rain, it was discovered that the spring which supplies water for domestic use on the forest was at an all-time low. Approximately 6" depth of water was in the reservoir. Further examination revealed that an earth dam below the spring had washed out during the January flood. Considerable time was expended during June in restoring this dam. We now have a depth of 30" in the reservoir, quite adequate for our needs. In addition to restoring the dam, the protective housing over the spring was replaced to keep it safe from contamination from small animals which previously had been trapped and drowned in it. Further work will be necessary on the dam to strengthen it. This means drawing in stone fill. A planting of Reed's Canary Grass will also be made on and around it to hold the fresh fill in place.

Approximately two miles of road were serviced and repaired during the quarter. Drainage facilities were repaired and improved to protect it from washing during flash storms, so common to this area. For this purpose, a road scraper was borrowed from the town of Williamstown.

As a fire protection measure, the tall grass and weeds were mowed around all of the buildings. A start was made in redecorating the staff quarters, but we haven't had enough rainy weather to complete this job as yet.

MISCELLANEOUS

As a result of the prolonged drought, the Governor of the State has imposed a limited closure on the forests of Massachusetts. All State Forests, Parks and Reservations remain open, while all other forest land has been closed. For our part, we have kept the forest open to the public, but have imposed a ban on all open fires. Conditions are not as serious in this part of the State as further east yet. Class 3 days have been experienced, but good rains on June 20, 21, 22, and 25 prevented a further build up.

The physical effects of the Cooperstown Forest Survey Office were transferred to Hopkins in the latter part of June.

VISITORS

During the quarter visitors to the forest included: John R. Curry, Adirondack Branch; Samuel Hutchinson, Massabesic Expt. Forest; Kenneth Dubuque, Farm Forester, Berkshire County; Wilson Hill, Farm Planner, Soil Conservation Service, Pittsfield, Mass.; George Mullins, Forest Survey, Laconia, N. H.

PLANS FOR NEXT QUARTER

1. Complete cultivation work on hybrid poplars.
2. Survival counts and growth measurements on plantings in hard-hack conversion study.
3. Complete marking work in Farm wood lot # 1.
4. Try to get cutting operations started on management studies.
5. Complete backfill on watersupply dam.
6. Complete decoration of staff quarters.
7. Make an intensive survey of market possibilities in vicinity.

QUARTERLY REPORT -- LEBANON EXPERIMENTAL FOREST

APRIL-JUNE 1949

by S. Little

PREScribed BURNS

During the quarter a short report was prepared, summarizing the information obtained from prescribed burning this past winter. This information was chiefly on the costs, factors affecting the costs, and burning conditions.

One of the factors affecting costs is, of course, the efficiency of the labor. Records of the burning of 1,500 acres in the Lebanon State Forest showed that one crew was about twice as efficient as another crew, but that the efficiency of both was somewhat greater in the 1948-49 season than in the previous winter.

Other factors affecting costs are the size of the holding and the type of labor. Labor regularly employed by an owner should usually do a cheaper job than labor hired specially for the burning. That was apparently true of the treatments made in adjoining private holdings this past winter. In one the owner's employees prescribe-burned about 1,500 acres at a cost of 15 cents an acre, while in the other special crews treated 866 acres at an average cost of 24 cents.

Relationships between measured fire danger and actual burning conditions have not proved consistent, chiefly because of the effects of amount of fuel, fuel type, location of danger stations, and inconsistencies in the values of measured fire danger. In general, the more fuel, the lower should be the fire danger if a light fire is to be used. However, there are great differences among fuel types. For example, on some days pine-swamp areas have been too wet to burn or on other days would burn too hard even though at both times satisfactory prescribed burns were made on upland sites. Even on upland sites there are differences due to the type of fuel. Under pine stands the duff is more compact and, during the winter, more heavily shaded than that under oaks. Consequently, in mixed stands a prescribed fire may not burn under clumps of pine even though it spreads satisfactorily over the rest of the area.

Locations of danger stations also affect comparisons of measured danger and actual burning conditions. For example, on the same day two stations in similar stands 2 miles apart indicated burning-index values of 45 and 70, the latter being much greater because the station was located near a large field and hence had higher wind velocities.

However, the most aggravating factor is the inconsistency in measured danger values. There have been days when the burning index was between 3 and 20 and (1) the fuels were too wet to burn, (2) good burns have been made, or (3) the fuels have been too dry, or the wind too high, to permit the satisfactory use of prescribed fire. Even for burns in the

same area the measured danger values are not consistent in indicating actual burning conditions. One tract was partly burned when the burning index was 8, unsuccessfully refired at 10, but successfully refired at 9. In another tract the fire would not spread at a burning index of 20, but would at 16. Initial burns of similar oak-pine stands within a short distance have been successfully made at index values between 4 and 10, but have been unsuccessful at 8, 9 and 12.

Comparative records for the last three years also show great differences between actual burning conditions and measured danger. For example, in the winter of 1946-47 satisfactory prescribed burns of oak-pine stands having good continuity of the duff layer were made when the burning index was between 5 and 10, but in the winter of 1948-49 between 9 and 20.

Much of the inconsistency in measured fire danger probably arises from the method now used in evaluating the moisture content of the bottom layers of duff. This is the number of drying days since various amounts of precipitation, but it does not include the accumulative effect of earlier precipitation, nor drying conditions and minor amounts of precipitation since the first drying day. Hence, prescribed burns can be successfully made on days of lower danger in winters such as 1946-47 (when precipitation was slightly less than normal) than during such winters as 1948-49 (when monthly precipitation was 1/2 to 3 inches more than normal).

BROWSING BY DEER

In connection with preparing a paper on slash disposal some information was obtained on the amount of browsing by deer on pine reproduction as affected by size of the terminal shoots and the protection afforded by slash. Apparently stout shoots are less digestible or more difficult to remove than slender ones. For example, in slash-free parts of a cut-over area reproduction tallies were made by the following diameter classes of the terminal shoots: 1/16 inch, 2/16 inch, 3/16 inch, and 4/16 inch or more. Seedlings damaged by deer browsing since the 1948 growing season formed 84 percent of those with the smallest shoots, 70 percent of those with shoots 2/16 inch in diameter, 30 percent of those with a 3/16-inch shoot, and only 8 percent of those with the largest shoots.

A light cover of slash tends to protect pine seedlings from deer browsing. Seventy percent of the seedlings thus protected had never been injured, while only 4 percent of the unprotected seedlings were uninjured. Repeated or severe browsing was noted on 68 percent of the unprotected seedlings, but on only 6 percent of the protected seedlings.

COOPERATION

During the quarter a few days were spent with State and SCS foresters inspecting prescribed burns made during the past winter on both private lands and state forests, in making plans for next year's burns, and in advising on cutting or burning treatments that might be applied to specific areas.

VISITORS

A group of 27 students and faculty members from Rutgers University visited the Experimental Forest on May 7, and another group on June 6. On May 10 and 11 I. H. Sims and A. A. Brown were in New Jersey. Other visitors, besides local foresters, included Professor L. L. Ilsley of Hollins College and P. Y. Burns of the University of Missouri.

QUARTERLY REPORT -- FARM FORESTRY RESEARCH
(Cooperative Project in Connecticut)

APRIL-JUNE 1949

By R. H. Fenton

PRESERVATIVE TREATMENT

Stepping Method

This quarter's report should mark the final reference to the stepping experiments. Most of the field work has been finished and the results are now being assembled for a report.

The original intent of this experiment was to determine a more rapid means of treating red pine tobacco poles. Later, the work was expanded to include any green, round pole products from fence posts to flag poles (or multiples of shorter products). Also noted was the applicability of the method to species other than red pine. It would not normally be practical to step hardwoods, and of course it is considered bad practice to "hang up" a tree in felling; yet, some thought should be given the possibility of treating gray birch, for example, and thus producing a durable, and attractive, rustic fencing material from an otherwise low-value species.

The following table presents the results of several random treatments carried out in May and June.

Species treated	Lbs. ZnCl ₂	Lbs. water	Duration of treatment	Length of bole fully treated	Treated products secured--suggestive or actual
Black birch	1.5	30	72 hours	35 ft.	Five 7' fence posts; or 1 tobacco pole and 3 posts.
Gray birch	1.3	25	54 hours	21 ft.	3 small fence posts.
Aspen	2.0	38	68 hours	35 ft.	5 fence posts.
R. Maple	0.5	10	40 hours	21 ft.	4 plant stakes.
R. Pine	2.0	38	40 hours	22 ft.	Small flagpole or farm utility pole. Or 1 town highway post and 2 farm fence posts. Or 1 tobacco pole and one fence post.
Hickory	1.5	30	20 days	6 ft.	Failure; neither species will treat by this method.
W. Ash	1.5	30	20 days	6 ft.	

Quantitative analyses have been made for zinc chloride distribution in 14 tobacco poles treated last fall, at points 3 feet and 11 feet from the butt (treated end). One series of analyses was made 40 days following treatment, the other 150 days after treatment. Some of these poles were stored horizontally and the remainder set upright in the ground to simulate actual service, directly after treating. These 2 analyses, combined with previous data, indicated that the ultimate diffusion of the salt throughout the poles is good when they are seasoned treated end up; is satisfactory when they are seasoned horizontally; and is poor with the treated end down during seasoning.

Some random observations resulting from the stepping experiments are mentioned:

1. Removal of the bark from the tree being stepped does not appear to slow down initial take-up or distribution of the salt.
2. Trees treated by stepping may be sap-peeled if done immediately after treating. However, the higher the salt concentration, the more difficult the peeling.
3. During the most active growing season, there is a heavy pitch flow from the severed butt of pines. However, this does not appear to affect take-up of the preservative if treatment is started within 2 hours of cutting.
4. Water-soluble dyes have been introduced in the preservative solution in order to trace visually the migration of zinc chloride through the wood. It has been found, however, that the salt solution will travel 2 to 3 times as far as the dye in the same period of time.

Other Sap Stream Treatments

A brief trial of a British water soluble preservative importation, phenyl mercury fixtan, was carried out by stepping, using red pine. Recommended concentration of this salt is 1 pound to 830 pounds of water. The treatment indicated very slow absorption compared to zinc chloride and, since it is a colorless solution, its distribution cannot be determined. The recommended 1/2 ounce of dry salt per cubic foot of wood appears very small, but the cost of this amount is about .20.

Considerable time was devoted to a sap stream treating method involving two variations, using zinc chloride: treating 10 posts each of 5 fresh cut species by the barrel method with the small ends immersed for initial take-up; a replicate treatment by applying dry salt to the small ends, held in place with tire tube sections; and samples, half of which were peeled, of the same species, without treatment as controls. All these posts were set in a fence line immediately after preparation with the belief that the salt solution will travel downward throughout the sapwood within a year, the treated ends, of course, being up.

This phase of the treating was conducted while the trees were in full leaf. It will be repeated this autumn after leaf fall and again next spring prior to the growing season.

This branch cooperated with a vocational agriculture school in planning and carrying through a farm fence post treating program. The barrel method employing zinc chloride was used, except for a demonstration of stepping. The only cost incurred was for the salt as the trees were donated and the labor supplied by the students as part of their training, so the project should be a success. Three hundred 7-foot posts were treated, most of which have been spoken for at the following prices, based on tip diameter: 3" (electric fence post) .30 each; 4-5", .50; 5"-6", .60; over 6", .70. The school now plans to incorporate a post treating program as part of its annual schedule.

Preservation With Oil Soluble Preservatives

The red pine highway post treating program referred to last quarter has been completed. One part of ten-to-one pentachlorophenol concentrate was added to nine parts of fuel oil as the 5% penta solution. Treating by cold soaking was started with the advent of warm weather, using a 24-hour soaking period. It soon became evident that this schedule was giving an absorption of over 2 gallons of solution per post with costs as follows:

1 gallon 10-1 penta concentrate	\$2.00	
9 gallons fuel oil/0.122	1.10	
10 gal. ready-to-use solution	<u>3.10</u>	.31 per gal.

Therefore the soaking period was cut to 7 hours at which time the absorption appeared adequate and at a reasonable cost.

The radial penetration was found to be a minimum of 1 inch with the 7-hour schedule. The penetration was visually determined by placing a core from the treated post in contact with an oil soluble dye in powdered form. The dye colored only that portion of the core impregnated with the oil solvent.

The operator had originally peeled this lot of posts with a draw-shave. A great deal of inner bark was left on, so he had to repeat the operation prior to treatment. This particular lot of posts, therefore, will probably be sold at a loss. This spring, however, it was recommended he try sap peeling the selected trees, to insure removal of the inner bark, before they were felled, to the required 7-foot length. After several trials this appeared to be a very efficient method of peeling where one peeled product is taken from the butt. Average peeling rate was 3 man-minutes per post or about 5 cents each.

Obviously, the peeled trees standing in the plantation were plainly evident to the cutters who felled them a few days later. It was proposed that the operator drop the peeled trees, leaving the tops on to hasten drying, but this plan could not be scheduled at present.

PRIMARY PROCESSING

Charcoal Manufacture and Utilization--Lump Charcoal

The apparent growing interest in the manufacture of native charcoal in the cinder block kiln was translated into reality with the construction, in May, of a ten-cord kiln by a local sawmill operator. The first burn has been made, and this branch is assisting the operator in marketing aspects on the basis that there has been much talk concerning the large local market and the small native production, but that no attempt has been made to bring these two factors into alignment.

It was found there is a large seasonal demand for charcoal along the seashore areas and that distributors would gladly handle native charcoal if they knew of a supply. This outlet, while only seasonal, appears to be the best market for the small producer to enter, at least at the beginning. He will receive 4 to 5 cents per pound for small bags of charcoal sold to distributors. Bulk lots of charcoal sold to the concentrated industrial market averages only 2 1/2 cents.

Briquets

The largest outlet for charcoal in southern New England, the tobacco growing industry, has a decided preference for briquets, most of which come from Michigan. Therefore this branch is cooperating in exploring possibilities in local briquetting facilities. Accordingly, 40 pounds of native hardwood charcoal were sent to a Pennsylvania briquetting machine manufacturer. There, the charcoal was briquetted experimentally and the results have been forwarded to the Northeastern Wood Utilization Council. An 8% starch binder was used and the briquets baked at 350° F. The resulting briquets appear equal in every respect to those already on the market.

Wood Chips

A local sawmill operator, who has found a ready sale for his sawdust and shavings as poultry litter and cattle bedding, was appraised of the light, portable chipper developed in Massachusetts. Hence, a visit was made to the plant with him to observe the latest development in this machine. It is now available with alternately toothed and straight knives, yielding a chip not unlike a very coarse sawdust. This operator would chip only slabwood and edgings. It is believed the chips would be entirely suitable for the uses mentioned, which are of considerable scope here.

While nothing factual can be reported on this development to date, it is mentioned as it appears to offer distinct possibilities in waste utilization, enough so as to seriously interest a mill operator.

Notes

During the quarter, this area was visited by Messrs. Doverspike and Lockard of the Station, and in June this project was represented at a conference of Branch Station leaders at Upper Darby.

The continued lack of adequate rain since late May is becoming of considerable concern. Several fires have been reported but thus far have been small. Precipitation for June has averaged only about 0.5 inches.

QUARTERLY REPORT -- ADIRONDACK BRANCH

APRIL-JUNE 1949

by William Rutherford, Jr.

During the second quarter of 1949 demon Drought has chased thoughts of fire damage ratings, visibility, backpack pumps, and smoke back and forth in our minds. The hot dry weather that has occurred throughout the Northeast poses a particular problem to the Adirondacks. Tourists fleeing from the heat flock into the mountains in search of cool lakes and fresh breezes. Their influx varies directly with the burning condition of our forests.

Local showers during the latter part of June have brought temporary relief to Paul Smith Experimental Forest. These rains have lessened our local fire problem but have not solved it.

PAUL SMITH EXPERIMENTAL FOREST

Our major field job has been the cruising and mapping of Block II, an area of about 650 acres. Block I, 1700 acres, was cruised and mapped last fall. We are using a line-plot survey designed to give a 10% cruise and detailed type and topographic maps. Two field assistants are helping us with the work. They are Lloyd Crary of Paul Smith's College, and Elmer Terrell of the New York State College of Forestry.

Stand conditions on Block II are encouraging. A light cut was made in 1913 which removed high quality pine, hemlock and spruce. Since that time there has been no commercial cutting on the area. It is now occupied by a highly merchantable stand of timber that is ready for harvesting. The stand is chiefly of mixed wood types containing large spruce and hardwoods.

The harvesting of this timber poses a logging problem. Block II is a peninsula between Upper St. Regis and Spitfire Lakes. A rather steep ridge forms the backbone of the peninsula. This ridge offers an obstacle to the construction of logging roads. The water in the lakes surrounding Block II is used in making electricity. As a result, the lake level is varied nearly two feet during the winter months, making the use of ice roads across the lake extremely dangerous.

TREE KILLING STUDIES

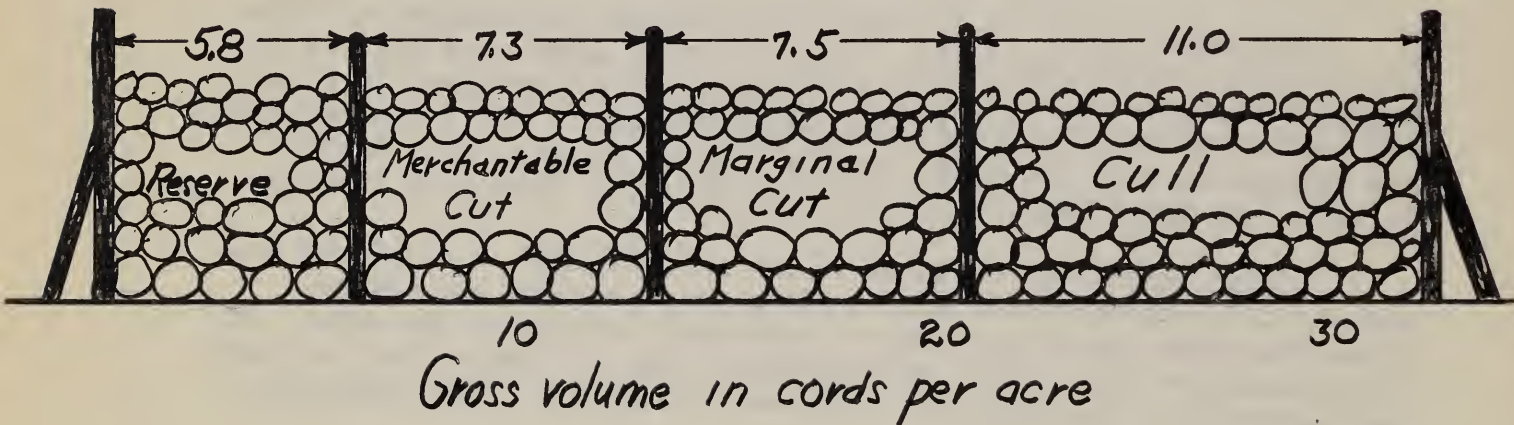
Fenchak is continuing our formal experiments in the use of ammate and sodium arsenite solutions for tree killing. In addition, exploratory studies are being conducted to test several new techniques of tree poisoning. One of these is the use of poison capsules inserted into holes bored in the bark and wood of the tree to be killed. Capsules containing sodium arsenite both in powder and liquid form as well as 2-4,D have been tried. Also, a mixture of 2-4,D and a penetrating oil has been painted on the bark of the tree to be killed. It is hoped that the penetrating oil will

carry sufficient poison into the vascular system of the tree to cause death. Several methods of bark preparation have been tried. For example, the poison has been brushed on light girdles made by a timber scribe, also painted onto bruised areas of bark. As yet it is too early to assess the results of these exploratory studies.

UTILIZATION OF WEED TREES

The major obstacle to good forest practice in the Adirondacks is the difficulty in marketing inferior hardwoods such as soft maple and beech, and poorly formed hard maple and yellow birch. To illustrate the size of this problem, all trees above 6 inches d.b.h. on a spruce-yellow birch plot were classified as 1) reserve growing stock, 2) merchantable cut, 3) marginal cut, and 4) cull. A pictorial presentation of the problem is shown below:

Primarily Softwood ← ————— ← *Primarily Hardwood*



To bring this stand under satisfactory forest management we must remove the marginal and cull trees. By marginal trees we mean those that contain cross-tie and bolt material. Cull trees may be partially utilized for hardwood pulp or fuelwood, if markets are available.

In an effort to explore the cross-tie market we are manufacturing 300 cross-ties. Perhaps this will point the way to a partial solution of the marginal tree problem.

Peeled hardwood pulpwood is currently bringing \$18 a cord FOB rail-heads. The staff has peeled some hardwood pulp on an experimental basis and decided that under prevailing wage rates we cannot meet that price. Local prices for fuelwood are also below our cost of production. This is largely due to waste product competition from two shuttle and bobbin mills and one veneer mill.

INSPECTORS AND VISITORS

During the past three months we have had an opportunity to show our forest to several visitors and inspectors.

V. L. Harper and I. H. Sims spent a week at Paul Smiths, N. Y., making their annual inspection.

L. R. Strickenberg made an inspection of our vehicles.

Hardy L. Shirley, Asst. Dean, N. Y. State College of Forestry, and Mrs. Shirley, visited Paul Smiths in early spring.

O. G. Koenig made a personnel inspection.

Fred Simmons stopped by to advise us on our logging problems.

The local forest practice board (New York Forest Practice Act) spent an afternoon with the staff and forestry faculty of Paul Smith's College.

Mr. David Smith, Instructor in Silviculture, Yale University, and eight students looked over our forest, paying particular attention to the various timber types present in this area.

QUARTERLY REPORT -- ANTHRACITE BRANCH

APRIL--JUNE 1949

THE POCONO EXPERIMENTAL FOREST

by C. F. Burnham

Cutting Practice Level Plots

Since April first the demand for mine timber has steadily dropped due to the decreased rate of anthracite production and the abundant supply of prop material on hand at the various collieries. Consequently the removal of timber from these plots has virtually stopped. The cutting job is about two-thirds done but it now looks as though it would be early fall before it can be completed.

A Research Development Plan

On April 6 the Director approved a research development plan for the Pocono Experimental Forest. This plan allocates certain areas of the forest to the following specific studies:

A. Pilot Plant Studies--18 compartments of approximately 40 acres each are to be used for the integrated production of saw-timber and other products under high order, good, and fair levels of management. Several different quantities of growing stock, cutting cycles and cultural practices are to be tested and evaluated. Another 12 compartments averaging 30 acres in size will be set aside for testing the production of mine props or other "bulk" products principally, but with other products to be harvested as they occur. Both uneven and evenaged systems of silviculture will be used under good, fair and poor levels of management.

Good headway is being made in establishing the boundaries of these compartments on the ground.

B. A Sustained Yield and Water Influence Study--Approximately 500 acres has been set aside to determine the silvicultural and financial results of a good level of sustained yield management on an area of moderate size, and to evaluate the effect of such management on streamflow. The watershed boundary of the unit has been located on the ground and, as intimated in our last report, construction of the stream gaging station started the first part of May. The weir and gage house are now two-thirds completed and should be ready to put into operation by mid-summer. The Delaware Basin Branch will conduct the streamflow studies on this unit.

C. Small Woodlot Management Studies--Two compartments, one of about 20 and the other of about 30 acres, have been allocated to show how, by methods usually available to a small woodlot owner, a woodlot can be made to yield an annual return while being built up to full productivity and to obtain a measure of the annual returns to be expected from such management. The boundaries of these two compartments have been established, a detailed work plan is in the process of preparation and some of the initial inventory work completed.

D. Cutting Practice Level Plots--50 acres, as reported for the quarter ending December 31, 1948, have been set aside for this study and actual cutting is underway.

E. A Natural Area--One compartment of about 25 acres containing a good sample of each of the four major types will be allowed to mature naturally without disturbance by cutting or fire. This area will be used to measure the effectiveness of silvicultural measures as compared to protection alone.

F. Reserved for Future Work--Approximately 200 acres will be reserved for future studies not yet formulated.

REGENERATION STUDIES

by W. E. McQuilkin

Scrub Oak Conversion

Early in April a Caterpillar D-7 bulldozer was hired to prepare furrows for planting on our Game Lands scrub oak area. This machine performed much better than our lighter BDH Cletrac which we had used to prepare the Bear Creek area. After some preliminary experimenting, the D-7 operator was able to do a half mile or more of furrow per hour which, at \$9.00 per hour, was getting site preparation costs down well under \$20.00 per acre. We believe that, with more experience and some modification of the job standards, a satisfactory furrowing job can be done with such equipment for close to \$10.00 per acre.

The plantings were made on both the Bear Creek and Game Lands areas as scheduled. A total of 3750 trees divided among 9 species was used at each place. Some plots will be released later as needed, others will receive no aftercare. Fertilizer in the planting hole was included as a treatment for the hardwood species only.

The species planted in 1949 are:

Red pine	Norway spruce
White pine	European larch
Scotch pine	Black locust
Jack pine	Red oak
Pitch pine	

Red pine is represented by 3 age classes of stock and Norway spruce by 2 classes. Japanese larch originally was to have been included but stock was not obtainable.

Spring planting activities in scrub oak included some replanting on the Delaware-Lehigh Experimental Forest. This is covered in the report of the Delaware Basin Branch.

Plant Poisoning Studies

In our report for September 1948, we described tests of several plant poisons, mixtures, and dates of application on scrub oak and associated species. Results given at that time were subject to modification according to sprouting activity of treated plants in the spring of 1949.

Observations this spring confirm that, of the treatments tested, ammate is definitely superior on all species. In concentrations of 2 pounds or 4 pounds per gallon, it consistently gave kills of scrub oak sprout clumps for both June and August applications. At 1 pound per gallon, many sprout clumps of scrub oak, chestnut, gray birch, and sassafras were killed, but there were some survivors. Of 8 red maple clumps, however, only 3 were killed by ammate at 1 pound per gallon.

2, 4-D sprays in concentrations of 0.1 and 0.2 percent were not lethal to oak, maple, or chestnut. Sassafras was killed to the ground but new shoots now are appearing, presumably from the same rootstocks. Gray birch stems which appeared last year to be killed by 2, 4-D are now showing life in adventitious buds. This growth at present is very weak; probably some of these budding stems will yet succumb.

Atlacide killed all species to the ground, but in most instances vigorous resprouting is now taking place. Addition of 2, 4-D at 0.1 percent to solutions of ammate and atlacide did not markedly increase their effects. Additions of dowax likewise were ineffective.

Of the low vegetation, blueberry, sheep laurel, and sweetfern have been generally killed by all ammate sprays and killed or much thinned by 2, 4-D. Bracken fern, and low chokeberry are resprouting except after the stronger ammate treatments. The chokeberry, which was a rather minor element in the blueberry-laurel undergrowth, appears on some plots to be coming back in greater density than before.

August treatments were more effective than June ones for all materials and species. In the June series, 4 of 12 oak clumps sprayed with ammate at 1 pound per gallon are dead; in the August series 11 of the 12 are dead. In the August series 6 of 12 oak clumps sprayed with atlacide are dead, as against no kills with atlacide in June. Among the blueberry-sheep laurel plots, those two species were pretty well eliminated in the August series except with the weaker 2, 4-D sprays, and 8 of the 18 plots are practically bare of living vegetation; in the June series only 3 plots are equally bare.

Supplemental tests involving concentrates of ammate, 2, 4-D and dinitro secondary butyl phenol, applied in notches or painted on single stems among a clump, have yielded little of significance. The treated stems generally die, but not much effective translocation to other stems in the clump has been obtained.

Although ammate applied at a concentration of 2 pounds or more per gallon apparently will control scrub oak vegetation, it would be almost prohibitively expensive to use as a site preparatory treatment. We therefore are continuing small scale tests of various materials and mixtures

in the hope of finding something that will do the job at less cost. Plans for 1949 call for tests of several mixtures of 2, 4-D with 2, 4, 5-T in water and in diesel oil, several mixtures involving additions of a contact poison, and others with additions of Goodrite latex VL 600 (formerly designated as Geon X). Some plots will be treated by bending and bruising the stems prior to applying stem sprays, in an attempt to increase absorption of the chemicals.

Besides the preceding treatments, which will be applied to small plots, it is planned to treat about 2 acres by relatively sure methods, to be followed by tree planting in the spring of 1950. This is for the purpose of gaining experience in the physical problems of planting in killed brush. One of the acres will be treated with ammate, the other with Weedone Brush Killer 32 in oil. All the above treatments will be applied in July or August.

Cooperative arrangements are being made through the Delaware Basin Branch with the American Chemical Paint Co. of Ambler, Pa., whereby they will furnish certain materials and equipment for the above tests. They will also utilize several acres of scrub oak land on the Delaware-Lehigh Experimental Forest as a testing ground for new materials as developed by their research division.

Under-Planting Hardwoods With White Pine

This study was described briefly in our report for September, 1948, at which time 93 percent of the 800 white pine seedlings planted under a light hardwood overstory still were alive. It was stated then that deer browsing likely would be the greatest hazard to early survival and growth, since the plots were known to be in a deer feeding area. An examination of the plots in June 1949 fully confirms that prediction. Survival has dropped only to 89 percent, but only 7 percent of the original 800 trees have entirely escaped browsing damage. Most of the browsed trees would recover if not further molested, as indicated by the continuing high survival, but that does not seem likely.

This test planting was not set up to find an answer to the deer problem. The results to date simply confirm that, in certain localities, the problem is there and constitutes a major obstacle to reforestation. Where deer are abundant, there is little hope that heavy damage can be averted by repellents or other tricks available to the tree planter. This problem transcends the field of forestry; it ranges also into the realms of game management, public education, and politics.

MISCELLANEOUS

Messrs. Harper, Sims, and Bevan spent several hours on a cold Sunday early in April watching the operator of the contracted D-7 bulldozer rip up some scrub oak on one of our areas preparatory to planting.

The State District Foresters in this vicinity show an increasing interest in the experimental work underway. Two full day field trips were conducted at their request to the Pocono Experimental Forest and the scrub oak conversion study areas during this quarter.

The spring meeting of the Anthracite Area Forest Research Advisory Committee took place on June 16. It consisted of a full day field inspection trip to the scrub oak conversion study areas. The technical aspects of the various site preparation methods, planting techniques and vegetative poisoning tests underway were described by the Anthracite Branch Staff. Herb Storey of the Delaware Branch gave a clear and concise description of the water run-off studies that have been initiated on the Delaware-Lehigh Experimental Forest. Members of the committee attending were Messrs. Cope, Conant, Bramble, McClintock, Stainbrook, and Burnham. Messrs. Cadwallader Evans, J. Arthur Bolender, and Robert Harrier were represented by Ivor Evans, Joseph Paddock and Harvey Frantz, respectively. In addition to the staff of the Anthracite Branch, Director Harper and Ivan Sims from the Northeastern Forest Experiment Station office in Upper Darby were present and participated in some of the discussions. The next meeting is to be held on the Pocono Experimental Forest sometime in October.

QUARTERLY REPORT -- CHESAPEAKE BRANCH

APRIL-JUNE 1949

MANAGEMENT

by Francis M. Rushmore

General

A. F. Hough was here with us for about two months during the quarter. He spent several days with personnel of the Maryland State Department of Forests and Parks inspecting plantations in western Maryland.

Plan For CPL Plots

Hough completed the writing of a draft for the Virginia pine CPL plan. Very little literature on the management of this pine has been published. The best bulletin available was one written in 1911 by W. D. Sterrett. Data from the 1938 thinning study furnished some helpful information.

Virginia Pine Thinning Plots

Seven weeks of this quarter were spent on revising data, analysis, and a rough draft for the Virginia pine thinning study.

Planting Where Slash Has Been Burned

Burning of the slash piles and planting was completed in April. Tulip poplar, hybrid poplar, and loblolly pine were planted in check plots and where 50 and 100 pounds of slash had been burned. By June 20 it was necessary to carry out the weeding phase of the study. This consisted of removing hardwood sprouts from stumps on half the plots. Some sprouts completely covered the seedlings on the check and on the 50-pound burn plots. There were fewer sprouts where 100 pounds of slash had been burned because most stumps within the fire failed to sprout.

Check Of A Virginia Pine Volume Table

The testing of an unpublished Virginia pine cubic foot volume table of the Southeastern Station revealed that it was satisfactory for use in this area. No adjustment was necessary for local use. Bickford's method of testing was used.

Observations Of Hybrid Poplar

A few poplar cuttings were planted by laying them horizontally in a shallow trench and covering completely with a little soil. They were planted on an eroded clay bank. By June 20 they appeared to be growing well in spite of the recent 17-day drought.

It was thought that this method might be of some value for control of soil erosion. Per foot of cutting, there would be about four times as many stems as would be produced by a cutting planted in an upright position.

Two factors indicate that hybrid poplar cuttings can be pretty rugged. These particular ones were discarded about a month before planting and laid in the open during that period. At the time of planting the buds had extended about an inch, but they came through the soil without damage.

Miscellaneous

Personnel of the Patuxent Wildlife Refuge did a little soil erosion control work on our land. They placed brush in gullies on an old road in the airport area. This was to keep soil from washing into one of their lakes.

FOREST GENETICS

by E. J. Schreiner

The major genetics activity at Beltsville during this quarter was the establishment of hybrid poplar clonal tests, an additional poplar stool plantation, and outplanting of spruce and white pine progenies which had been growing in the Morris Arboretum nursery since 1943.

Sapling clonal tests (16 tree plots) of 49 hybrid clones were established on two different sites, two replicates on each site. A crop-tree clonal test (100-tree plots) with 30 clones was planted in two replicates.

Similar tests were established at the Hopkins Memorial Forest with 50 clones in the sapling tests and 25 clones in the crop tree tests. The Hopkins planting work was handled by the Experimental Forest personnel under the supervision of J. W. Wright. The establishment report on the 1949 hybrid poplar clonal tests has been completed.

Poplar Disease Resistance Studies

Dr. Waterman and her assistant spent about two weeks during June inoculating an additional 100 hybrids for tests of susceptibility to Septoria canker. Dr. Waterman also inoculated a sufficient number of one-year-old trees in the 1948 test plantations to establish the disease for a study of natural spread among the hybrids being tested in these plantations.

Regeneration

Considerable time was spent on checking the revegetation results on the A.R.C. Airport. Vegetation over most of the Forest Service area is satisfactory. The four 1-acre replicated treatment plots continue to show considerable variation between treatments. Control areas are less than 20% vegetated; the best results, 90-100 percent cover, being obtained on plots receiving two applications of fertilizer and lime since 1945.

Summarization of results to date has been started.

Lectures And Visitors

Two lectures on forest genetics were given by E. J. Schreiner at the University of Maryland; on the evening of April 6 to the Plant Industry Club of the College of Agriculture and on April 8 to students in the "Introduction to Forestry" course.

The following visitors were received at the Chesapeake Branch during this quarter.

Dr. Franz Germeten, Forest Officer, Forestry School, Steinkjer, Norway, and Dr. Elias Mork of the Norwegian Forest Experiment Station, Norway—these two foresters, traveling in this country under ECA auspices, were interested primarily in forest genetics and tree breeding. They spent a full day at Beltsville in discussion of forest genetics, forest tree breeding, and inspection of the genetics plantations.

Mr. R. H. Murray, of Sudburg, Ontario, Canada—Mr. Murray was interested in tree injury due to toxic substances in the air particularly research methods applicable in localities where there is evidence of injury to trees from manufacturing plants.

Eleven members of the Statistical Seminar spent April 19 at Beltsville. These visitors were given a more or less detailed review of the management and genetics research underway, and planned, at the Experimental Forest. The group was then taken on a tour of the Patuxent Refuge and of the Agricultural Research Center.

Five forestry students from Turkey were brought to Beltsville on the afternoon of June 21, by Mr. Perkins Coville. These students are in this country under the auspices of the OFAR for an extended period of orientation and study. They were particularly interested in poplar which is now being widely planted in Turkey.

MORRIS ARBORETUM

by Jonathan W. Wright

As usual, April and May were the busy months at the Arboretum, for into that period was crowded most of the control pollinating work of the year.

The maple breeding work was done mainly on box elder and Norway maple female parents, using these same species and sugar maple as pollen parents. We have tried these same crosses unsuccessfully previously, but a Russian investigator's optimistic report on the hybrids of these species made one more attempt desirable.

This year the ashes in the Philadelphia vicinity bloomed better than in either 1947 or 1948, and it was possible to make several interspecific crosses between closely related species. To date, much of the

fruit from these crosses is holding on the tree—a hopeful sign.

In 1948 the cross between Norway and Chinese blue spruces gave over 100 hybrid seedlings whereas several other species combinations gave no good seed. Accordingly this year's work was aimed at duplicating on a large scale this same cross. Unfortunately none of our own Chinese blue spruces flowered nor did specimens in two other arboreta to which we sent for pollen. A few pollinations were made on white and Serbian spruces.

Several species of white pine bloomed in the Philadelphia area this year. Hence we were able to make on a large scale crosses involving the eastern white, Himalayan white, and Japanese white pines as female parents, and eastern white, Himalayan white, Japanese white, Korean white, Swiss stone, western white, and limber pines as male parents. Nearly all the crosses had been made successfully before on a small scale and shown some promise.

The flowering behavior of the hard pines was not so satisfactory. We had planned on large scale production of the hybrids Japanese red x Scotch and Japanese black x Austrian, both of which are showing promise in field trials. Normally both the Japanese species flower prolifically, but this year several of the bagged trees lost all their flower buds before opening. However, we were able to make a number of other hard pine crosses to determine crossability.

Because of the rush of breeding work earlier, it was necessary to delay the transplanting of greenhouse stock and seed sowing work until early June. With the long June drought this was bad, but daily watering has brought most of the stock through satisfactorily. This year, following the lead of most large forestry nurseries, we have done the conifer seedbed weeding chemically with a naptha base solvent. As yet it has not damaged any of a large number of common and rare conifers but has disposed of the weeds.

QUARTERLY REPORT -- DELAWARE BASIN BRANCH

APRIL-JUNE 1949

By Nedavia Bethlahmy

During this quarter we advanced on three fronts. First, we gained additional knowledge concerning the physical aspects of Dilldown Watershed and acquired some of the tools needed for the work. Second, we initiated action on an hydrologic study of another watershed. Third, we acquainted the public with some of the work we are doing.

DILLDOWN WATERSHED

Topography

The boundary of the southeastern quarter of the watershed has been determined and mapped. This topographic survey is still in progress. During the latter part of June, the U.S.G.S. assigned two of its men the task of determining the elevation of the weir and the wells with reference to mean sea level.

Geology

Willard O. Lowe, a graduate student of Lehigh University, completed a report on the geology of the Dilldown Watershed. This report indicates that the watershed is in an anticlinal structure which trends in an E. NE. direction. Two geological formations are exposed in the area: the Honesdale gray-green sandstones and conglomerates and the Cherry Ridge red beds of conglomerates, sandstones and shales. Glacial debris is abundant. An extensive boulder field is present in the western part of the watershed. A swamp exists in the southwestern portion.

Soils

Soil samples of consecutive horizons were taken at one site in order to calibrate fiber glass moisture units in them. The purpose of the calibration is to determine a set of curves which will indicate the amount of moisture present in a given soil when a certain electrical resistance is encountered on a Colman ohmmeter. The calibration of these soils is almost complete. The next step will be to put the units in the ground into the horizons for which they were calibrated.

Climate and Streamflow

	<u>April</u>	<u>May</u>
Temperature - maximum	75° F	87° F
- minimum	24° F	32° F
- average	44.8° F.	56.8° F
Number of storms	12	11
Precipitation		
Total (inches)	5.40	6.66

Climate and Streamflow (Continued)

Runoff at weir	April	
	Thousand gallons	Acre Feet
Maximum daily	20,734	63.63
Minimum daily	2,261	6.94
Total	163,711	502.41
Total in inches depth over the watershed	3.35	
Humidity (at 9 A.M.) at Pimple Hill	April	May
Maximum	100%	100%
Minimum	40%	47%
Average	68.7%	76.0%
Wind velocity (Mph) at Pimple Hill		
Elevation above ground surf:	8' 54'	8' 54'
Maximum (24 hr. average)	19 34	11 21
Minimum " " "	5 11	3 8
Average	9.8 20.9	7.4 15.0

General

The climatologic and hydrologic data for this quarter have not been completely assembled so that a quarterly analysis cannot be made at this time. Thus far, the month of June has been very dry so that the soils in the watershed dropped below field capacity.

Equipment

A Bouyoucos hydrometer and a set of pH indicators were ordered and received. A volume weight sampler with an improved design is being constructed locally.

Concrete bases for a new instrument shelter and the anemometer were laid at Pimple Hill. Two Alter-type windshields for rain gages were built locally. A new climatic station installation was started at a site near the center of the watershed.

The Pennsylvania Department of Forests and Waters installed a new Stevens water stage recorder at the weir.

A 1-1/2 ton Dodge truck is now available for the use of both this Branch and the Anthracite Branch. The Pennsylvania Department of Forests and Waters supplied the resident hydrographer with a new jeep equipped with a blade. During the winter months the jeep will be used to clean the snow off the roads.

The Pennsylvania Department of Forests and Waters improved greatly the roads to the tower and the streamgaging station by adding gravel and improving the drainage.

SCRUB OAK CONVERSION STUDY

Because of poor quality stock, the Japanese larch and 2-0 pitch pine plots on the Pimple Hill scrub oak area suffered excessive mortality the first year. There was also considerable mortality in the 3.5 acres of roadside demonstration plantation. Replanting was done on these three situations in 1949. On the plots the scattered survivors were removed, so that we would not have two lots of trees and planting dates represented within a plot. Japanese larch was not obtainable and European larch was used here for replacements.

In the roadside plantation, all failed spots were replanted to either red or pitch pine. The total replanting job required about 3400 trees, of which 1650 were used on plots and the remainder on the roadside area.

No other work has been done on this area in 1949 except to cultivate plots listed for such treatment. A tally of survival will be made later in the summer.

POCONO EXPERIMENTAL FOREST

Materials have been acquired, and work is now progressing in building a weir at the Pocono Experimental Forest, which is a part of the Anthracite Branch. At this watershed we will take measurements to evaluate the effect of greatly increasing the timber stand and the harvesting of such stands upon the quality and quantity of water.

NEW RESEARCH

Storey and Reigner inspected some plots near Chester, N. J. where the effectiveness of different plant poisons was observed. Representatives of the American Chemical Paint Company later visited the Delaware-Lehigh Experimental Forest and evinced great interest in our conducting scrub-oak poisoning research. The chemicals to be supplied will include 2, 4-D, 2,4,5,-T and other chemicals that are still in the laboratory phase. Research will also be conducted on the methods to be employed in applying the poisons. These studies will be supervised by McQuilkin of the Anthracite Branch.

TALKS AND MEETINGS

Storey and Bethlahmy attended the A.G.U. meeting in Washington where the latter presented a paper titled "Factors Affecting the Formation of Concrete Frost." The paper was submitted for publication in the A.G.U. Transactions.

Reigner and Triem spoke before groups of students at Bethlehem and Easton on the significance of Arbor Day.

Storey attended the annual Incodel meeting at Pocono Manor and spoke on the research being conducted at Dilldown and of its significance to the interested states.

VISITORS

Visitors to the Dilldown watershed during this period included forest officers of the Pennsylvania Department of Forests and Waters, Dr. White (President of Haverford College) with a group of students, and members of the Advisory Committee of the Anthracite Branch.

PERSONNEL

Daniel W. Triem completed his term of temporary work with this Branch. He is now working with the S.C.S. in Reading, Pa.

Francis Riley, a conservation student at Lehigh University has been assigned to this Branch for work during the summer months.

QUARTERLY REPORT -- MOUNTAIN STATE BRANCH

APRIL-JUNE 1949

by Thomas G. Clark

GENERAL

During the past quarter, the efforts of the Mountain State Branch were directed toward making the Fernow Experimental Forest a going concern, completing the field work on the cove hardwoods growth study, and completing the field work on the strip mine revegetation survey.

Weitzman made two trips to Upper Darby; one to discuss the Fernow Management Plan and the other to attend a meeting of work center leaders.

PERSONNEL

Leroy Kelley and Frank Vande Linde, student assistants from West Virginia University, reported on June 6, 1949, for summer assignments. Several days later Kelley received a P-1 offer from Region 8 of a position on the Texas National Forest and accepted employment there as of July 1.

Donald Hebb, a West Virginia University student, is on temporary loan from the Monongahela National Forest. He is assisting Holcomb on the growth study.

The West Virginia Forest Survey will be completed on or about July 1. Mountain State Branch personnel will miss Fred Hampf, Ted Grisez and Bill Goodheart of the Forest Survey, along with Carroll Smithson, Pete Samsell, Lee Wilson, and Bob Kletzley of the Conservation Commission.

PUBLIC RELATIONS AND MEETINGS

Holcomb gave an informal talk to the Forestry Commission of the Beckley (W.Va.) Area Rural Development Council. He discussed the research program of the Mountain State Branch and offered suggestions towards solving some of the Forestry Commission's problems.

Weitzman discussed the research program of the Mountain State Branch before the West Virginia Forest Council, which met in Elkins on May 20 and 21.

Barr discussed our proposed logging program on the Fernow Experimental Forest with the Parsons' city engineer. Parsons' water supply is obtained from the Fernow.

Bevan and Weitzman were called to a state-wide conference June 27 and 28, at Fairmont, West Virginia, to determine the method of procedure for the elimination of floods through a coordinated land-use program. They spent two additional days on a survey of flood damage done by the recent floods in the Potomac Watershed in Grant County, West Virginia.

PUBLICATIONS

Weitzman, with the cooperation of the Upper Darby staff, prepared a sixteen page pamphlet on the Fernow Experimental Forest. This booklet received general distribution at the West Virginia Forest Council meeting.

WEST VIRGINIA FOREST COUNCIL

The Monongahela National Forest and the Mountain State Branch were hosts to the West Virginia Forest Council on May 20 and 21. The West Virginia Forest Council is made up of all parties interested in the wise use of the forest resources in West Virginia. The subject of the meeting was "Forest Research in West Virginia".

The May 20th session consisted of talks and discussions on forest research in West Virginia climaxed by a banquet at which Lloyd Partain of the Curtis Publishing Company was the main speaker.

The next day was spent on a field trip through the Fernow Experimental Forest. Warwick Doll of the U. S. Geological Survey, Water Resources, lead an interesting discussion on stream flow measurements.

Clark lead the discussion on the project outlined for the cutting practice level plots. Much interest was shown towards these plots, particularly by the lumberman and mine operators present.

COOPERATION

Boyd Patton, State Soil Scientist of the Soil Conservation Service, completed the field work on a soils map for the Fernow Experimental Forest.

The Mountain State Branch is remodeling the work shop at the Fernow Experimental Forest in order to have space available for a small soils laboratory. This laboratory may be used in cooperation with the West Virginia Agriculture Experiment Station.

Barr assisted the Monongahela National Forest for three days in their spring planting projects.

VISITORS

Dr. Elias Mark and Mr. and Mrs. Franz Germenten from Norway visited the Fernow Experimental Forest as part of an extended tour of the United States.

W. G. Wahlenberg and W. T. Doolittle of the Southern Forest Experiment Station obtaining data on epicormic branching of yellow poplar. Preliminary growth data from this study indicates an average growth of around 110 cubic feet per acre per year on the cove hardwood sites on the Fernow.

Mr. Remington of the Washington Office, Mr. Kennedy of the Regional Office, and Mr. Smith and Mr. Mahoney of the Monongahela National Forest, inspected the road system on the Fernow. The proposed access roads on the Experimental Forest were discussed. Mahoney conducted a preliminary survey of one of these roads.

Dr. McClintic, Director of the West Virginia Conservation Commission, Mr. W. B. Sayers, West Virginia State Forester, and Mr. Wood, Supervisor of the Monongahela National Forest, visited the Fernow and discussed the general over-all plans for the forest.

E. A. Colman of the California Experiment Station, on special detail from the Washington Office on forest influences, visited the Mountain State Branch.

Ineson spent several days at the bunkhouse in conjunction with completing the Forest Survey in West Virginia.

Dr. Harper visited the Mountain State Branch on April 11 and 12 to discuss the research program for the coming fiscal year.

FERNOW EXPERIMENTAL FOREST

The general economic situation climaxed by the coal strike has postponed logging on the forest. It is hoped that as soon as the mines resume operations that a cooperator can be found and that logging will be started.

The fire weather this past fire season caused some anxiety. A burning index of 90 or better was recorded on several occasions. Ranger Rowland and his crew are complimented on their public relations work. It was so well done that no suppression work was necessary on or about the Fernow.

The farm wood lot, with a high residual volume, has been inventoried and marked for cutting. In conjunction with the farm wood lot inventory it was found that one half inch hard copper tubing, $2\frac{1}{2}$ feet long and stamped with quarter inch letters has proven satisfactory for marking permanent corners and camera stations.

The cabin on the Fernow has been repaired. This building will house logging tools and a black smith shop.

An oil house has been constructed to store paints, gasoline, and oils necessary in operating the forest.

SPECIAL STUDIES

The field stage of the spoil bank revegetation survey is completed. A report on this survey will be completed by early August.

Holcomb reports excellent progress this past month on the cove hardwood growth study. Field work on the project will be completed by the end of the fiscal year.

QUARTERLY REPORT -- PENOBSCOT BRANCH

APRIL-JUNE 1949

by T. F. McIntock

GENERAL

April was spent principally in rounding up loose ends of various office jobs associated with the preparation of records of budworm experimental cutting areas. In May the field season got under way and in the remainder of the period most of the work at this Branch has been on post-logging follow-up of those cutting areas.

The staff was augmented by the return to duty of Walter J. Kidd who has been on educational leave since last September. Joe has been attending Syracuse University and has just received his M. F. degree there.

Two temporary men have been employed for the summer months. Paul E. Marshall and Marvin L. Chitty, both recent graduates in forestry from the University of Maine, are working as agricultural aids.

The budworm epidemic has increased considerably in portions of the state, though it has not yet attained the proportions of a major outbreak. The principal budworm concentrations at this writing are in the Cross Lake area of northern Maine and the region around Moosehead Lake. The survey being conducted jointly by the State and the Bureau of Entomology and Plant Quarantine is still in progress and the actual extent of the epidemic will not be known until later this summer.

Based on more or less casual observations of the staff, and judging from comments by others who have been in the field this spring, the white birch seems to be improving throughout this region. There is little new dying of shoots and the stands look much better generally. While it is too early to make any definite statements, it may be that the worst of the epidemic has passed and that most of the white birch now surviving will pull through.

The State Legislature pushed through several bills dealing with forestry matters in the closing hours of the session. Chief among these is the one giving the State authority over forest fires occurring in the so-called organized townships. Previously the State served only in an advisory capacity, with the result that large fires were not properly handled. The new legislation will greatly enlarge the facilities and personnel of the Maine Forest Service, an action which has long been needed.

EXPERIMENTAL FOREST

Complications involving clear title to the land, plus necessity for slight revisions in the lease have delayed acquisition of the experimental forest tract. It seems highly probable that the final approval of the project will be obtained by the end of July.

BUDWORM EXPERIMENTAL CUTTINGS

Establishment of permanent study plots has now been completed on two areas. In addition, 200 sample trees have been selected, numbered and described in detail. These trees will provide a basis for correlating budworm damage with tree characteristics and stand composition.

Agreements have been reached for establishment of the last two budworm study areas this year. One of these is with the Dead River Company and will include a 200-acre tract in the 100,000 acre forest management unit recently set up by the company and the Eastern Corporation, a large paper manufacturing concern which will buy and operate the timber from this area. The other is one of the so-called public lots which are owned by the various townships and administered by the State. This represents the first attempt by the State Forest Service to impose forest management upon these public lots. If the type of cutting practice applied in this experiment proves successful, similar practices may be adopted for most of the other public lots.

GROWTH STUDIES

A two-day conference to discuss methodology of growth studies was held at this office. Twelve representatives of pulp and paper companies and other timberland owners attended, as well as two members of the forestry staff of the University of Maine. Some progress was made, particularly in the direction of agreement among the various companies as to the pooling of data and the need for establishment of a set of uniform standards.

MEETINGS

McLintock spoke to the University of Maine Agriculture Advisory Committee, outlining the research program at this Branch. The experimental forest project was explained to a meeting of the Forest Industries Information Committee at Portland. McIntock also participated in a training school for State Forest Insect Rangers, describing the aims and objectives of the forest management research program of spruce budworm control.

QUARTERLY REPORT — WHITE PINE BRANCH

APRIL-JUNE 1949

by John R. McGuire

GENERAL

The preparation of study working plans and establishment reports occupied much of the time during the quarter. Two of the most important plans were approved by the Director.

The spring fire season was uneventful. Two prolonged dry periods made it necessary for Maine's Governor to ban smoking and use of fire in the woods. In the fire area, tree mortality due to fire and insect damage continues, but such losses, so far this year, are relatively minor. The red turpentine beetle is now causing most concern to the owners of burned woodlots. Some burned timber is still being cut but the market for such stumpage is not steady.

A Connecticut type, cinder block charcoal kiln is under construction near the Massabesic headquarters. It will have a weekly capacity of two cords, either pine or hardwood. Long logs will be decked near the kiln and bucked into four-foot bolts by means of a bicycle saw. Most of the wood supply will come, eventually, from the Massabesic Farm Woodlot.

The Massabesic TD-6 tractor is now equipped with a steel boom built of seven-inch channels mounted over the winch. It is attached by cable to the hydraulic arms which operates the 'dozer blade so that the boom can be raised or lowered 45 degrees in a vertical plane. A $\frac{1}{4}$ -inch steel plate has been mounted as a safety canopy over the seat for protection of the tractor operator. Sufficient equipment is now on hand or on order to permit the Massabesic logging job to get under way very shortly. Final preparation of a cooperative logging agreement has been delayed as a result of the fire which razed the Shepard and Morse sawmill at Alfred early in June. The company expects to have temporary mill operations in progress before long. Eventually a new electric mill will be built.

The road maintenance crew under Stubby Horn from the White Mountain has just completed another very satisfactory job on the Massabesic road system. Some culverts were replaced and the grader was run over the roads for which we are responsible.

Mac Williamson left for his new job at the Chesapeake Branch on June 22. On June 23, Sam Hutcheson arrived from Upper Darby to take over the clerk's job here.

McGuire spoke on white pine research and the branch program at the June meeting of the Western Maine Forest Forum.

FOREST MANAGEMENT STUDIES

The compartment study plan, as finally approved, allows for harvest cuttings this year in four of the thirty-two compartments. These are:

<u>Compartment</u>	<u>Treatment</u>
85	High-order, patch cutting
4	Good, patch cutting
78	Fair, seed tree cutting
3	Poor cutting

The Massabesic Cutting Practice Level Plots are almost ready for cutting. Original numbers of trees, basal areas and board foot volumes per acre have been computed. The four eight-acre plots are shown to be relatively uniform. The plot assigned poor cutting practice now has the highest proportion of pine (88 percent). This should minimize any criticism that the poor cutting plot was poorer than the others originally. Pure pine stands, however, are present on each plot. All of the plots now carry at least 11 MBM per acre. Records will be kept by stands within plots. (by T. W. McConkey)

A study of silvicultural control of the white pine weevil, in cooperation with the Bureau of Entomology and Plant Quarantine, will make use of the various compartments. Plans will be incorporated in a forthcoming supplement to the compartment working plan. For this year, however, cooperative white pine weevil work will be limited to a study of plantations in the State of Maine. The Maine Agricultural Experiment Station and BEPQ this summer will make a joint survey of white pine plantations to estimate weevil damage during previous years. Details of the field procedure were decided during a recent trip in the Augusta area conducted by Professor Ashman of the University of Maine for Messrs. Brown and Schaffner of BEPQ and McGuire.

Although this branch is not working with silvicides, a few tests have been made in order to familiarize ourselves with the more common methods and materials. Of possible interest is a small-scale test indicating partial selectivity in a two year old stand of grey birch seedlings, white pine and hemlock. In early June a small plot was sprayed rather lightly with a mixture of Esteron 44 and 245 in diesel oil (1 tablespoon of each compound per pint of oil). The foliage was covered, but not saturated, by spraying with an ordinary "Flit" spray gun. Two weeks later the birch seedlings were entirely brown. The pine and hemlock seedlings, however, were well protected by the birch overstory and suffered little damage. (by T. W. McConkey)

REGENERATION STUDIES

Some 8,000 white and red pine 3-0 seedlings were planted on various Massabesic sites this spring. This was a continuation of the planting site study begun last year. The pales weevil is still very active this year in all plantations on or adjacent to logged-over areas regardless of degree of burn. Planting costs this spring were about half the costs of the 1948 planting job, due to cheaper planting stock and less expensive labor.

Direct seeding studies this spring again ran into trouble with rodents. Rodent damage was less, however, than last fall; fewer seeds were eaten in the burned woods than in burned-over old fields. (Trapping showed white-footed mice to be the principal culprits.) Best results were obtained by using seed which had been stratified at least eleven weeks and then sown below the surface of the ground either in drills or by pressing in with the foot. Rodent control is still the first prerequisite to any kind of success with direct seeding of white pine.

In the absence of an effective rodent repellent, cartridge planting with newly germinated seedlings--or perhaps cartridge seeding with stratified seed--appears to offer one promising field for further study. Tests of cartridge methods will get under way next fall.

QUARTERLY REPORT -- WINNIPESAUKEE BRANCH

APRIL-JUNE 1949

By V. S. Jensen

FOREST MANAGEMENT--SPRUCE-FIR

The establishment and initiation phases of spruce-fir management studies undertaken as part of the experimental budworm control program was largely finished at the end of the fiscal year. The recruise and selection of permanent sample trees was completed on five of the six study areas. In addition to post cutting field activities on the remaining study area which will be operated this season, there remains a considerable amount of compilation work and progress reports.

Prescribed cutting methods of all degrees have been highly successful in reducing the vulnerability of stands with a high fir component. In extreme cases, stands with a vulnerability rating in excess of 700 (Westveld's formula) have been reduced to less than 1/10 of that amount even in applying a "C" (light) type cutting.

Windthrow and snow damage after logging on softwood areas, even following a removal of slightly in excess of half the volume, has generally been very moderate for the first one or two years after cutting. Fir losses averaged about three times as high as spruce, heart rot and hidden defect in the former being a major factor. In some stands, predominantly fir, where less than 1/3 of the volume remained after cutting, trees containing almost 10% of the residual volume were damaged. The bulk of these trees are dead or will eventually die.

The prospects of successfully establishing new and advance reproduction following cutting operations, a major consideration in operating second growth spruce-fir stands, are as yet somewhat uncertain. Some areas look very promising, while others are largely lacking in the desired species. In spite of blanks, irregularities, and understocking, the likelihood of another well stocked spruce-fir stand is definitely better than on similar commercial clear-cut areas.

SPRUCE-FIR PULPWOOD UTILIZATION -- TOP CUTTING DIAMETERS

The following tabulation is based on merchantable top DIB measurements obtained on one of the Vermont management study areas:

	Spruce (144 trees)	Fir (100 trees)
Max.	6.9"	6.5"
Min.	3.0"	2.7"
Ave.	4.38"	4.38"

MARKETS

Supposedly because of heavy inventories of expensive wood, the demand for spruce, fir and hardwood pulpwood is very definitely off. Operations are restricted and largely confined to peeled wood of all species. The usual limited market for white pine pulpwood practically disappeared. Mill pulpwood prices are generally off from \$1.00 to \$1.50 a cord.

With the tapering off in demand for expensive spruce and hardwood lumber, sawmills are slowing up or ceasing operations. The largest hardwood mill in New Hampshire recently closed after operating continuously at least one shift for the past 8 years.

Bolt mills (largely paper birch) are cutting out their present supply of round stuff and working off their considerable square stock inventory before resuming full scale operations.

Veneer logs are moving rather slowly as enough logs are on hand or in sight to meet requirements for the near future.

Piling, a relatively unimportant product, is the only bright spot. Norway pine stumpage still finds a ready market at an attractive price.

BEECH SCALE

Dr. Spaulding of the Division of Forest Pathology and Dr. MacAloney of the Forest Insect Laboratory spent several days in New Hampshire and eastern Maine with White Mountain and Station members. The trip was concerned mainly with areas where beech scale had become well established.

Aside from the Portsmouth area, the scale in New Hampshire was first identified on the Bartlett Forest in August 1939. Since that time, it has been found widely distributed over the White Mountain region, but only east of the Presidential Range. Possibly minimum winter temperatures have limited its western spread as temperatures well below -30° F. are usually recorded in the Connecticut River drainage. Supposedly the lethal temperature for scale is about -35° F. The associated Nectria that follows scale was found well distributed, but not too abundant over the scale infected areas. To date, there has been no wide spread beech mortality that can be attributed to the insect and disease. A check on a limited number of trees at Bartlett, noted as heavily infected in 1944, showed only one dead tree. Whether or not this was the result of scale and fungus is questionable. In some cases, the scale population has declined. In view of heavy losses in Maine and the Maritime Provinces, the situation in the White Mountains should not be dismissed lightly even though beech is far from a premium species at the present time. Heavy mortality on areas such as the Bartlett Forest (beech, 28% of volume) would represent a real loss.

FIRE WEATHER

Very unusual weather conditions during June (last general and heavy rain, May 28) raised the fire danger unreasonably high for the summer months. Conditions were, however, much less critical in northern than southern New Hampshire and Vermont or southern New England. Although Sims and Westveld were greeted with snow on June 8, quite a few Class 3 fire days were recorded before June 20. Heavy showers the last ten days in June noticeably eased the situation.

VISITORS

Professor Farnsworth and 26 students from the New York State College of Forestry spent half a day on the Gale River Forest. If these annual visits can be extended to a full day, time will be divided between Bartlett and Gale River; otherwise Bartlett will supplant Gale River on the New York students' spring trip itinerary.

EXPERIMENTAL FORESTS

Aside from scheduled periodic stand remeasurements, work at Bartlett was confined to the preliminaries of re-activating an intensive work program on the area in July.

Except for limited activities by the forest pathology group in connection with virus grafts on paper and yellow birch, no technical program is anticipated on the Gale River Forest during the present field season. This year's program has and probably will be restricted to adequate fire protection, limited maintenance work on fire lines, and providing water to all outdoor hose outlets on the headquarters site.

